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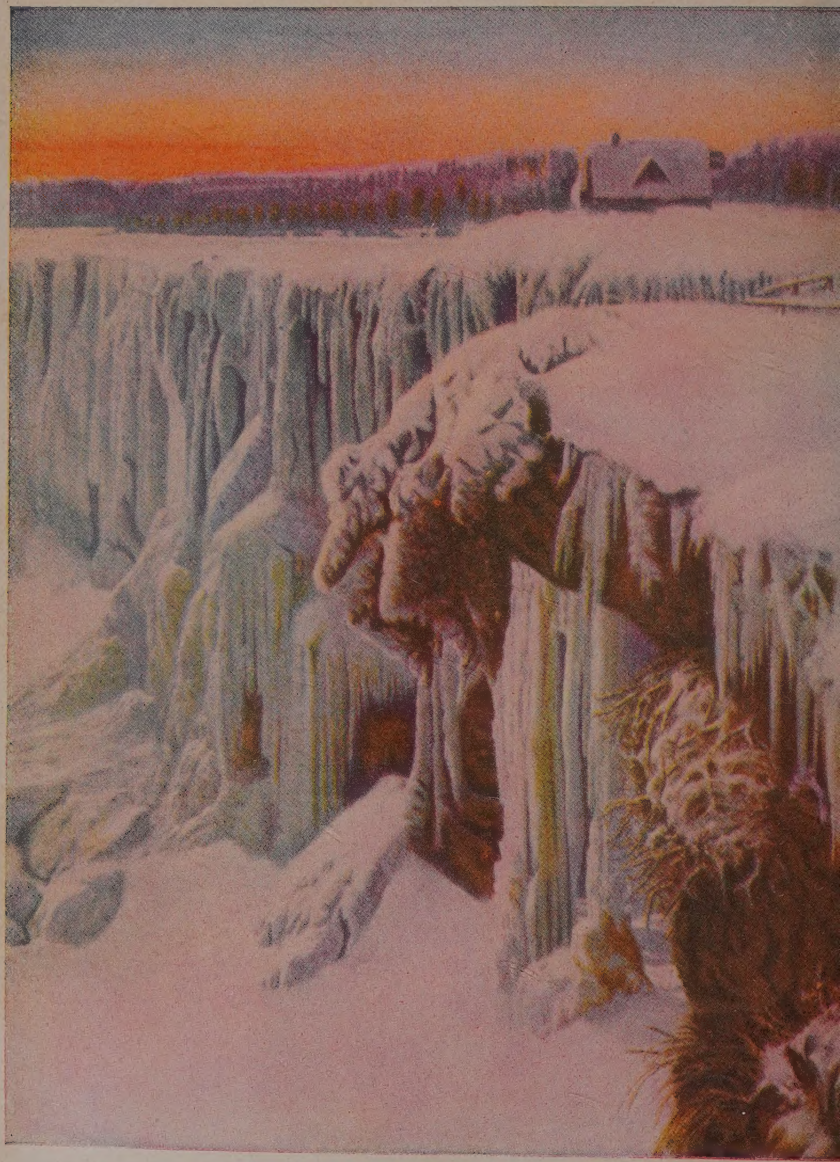

THE FALLS OF NIAGARA IN WINTER

The Horseshoe Falls looking from the Canadian side. Winter has frozen fast its rush of water and with it stilled its mighty roar. Its spray is turned to myriads of glistening crystals on rock and tree.

ADAIR'S NEW ENCYCLOPEDIA

COMPLETE — CONCISE

A New and Up-to-date Reference Work

FOR

HOME, SCHOOL and OFFICE

IN FIVE VOLUMES
WITH FIFTY FULL PAGE MAPS

VOLUME THREE

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GENTIAN, natural order *Gentianaceae,* herbaceous perennial plants (characterized by simple exstipulate leaves, the spiral [imbricate] arrangement of the petals in flower buds, and absence of latex in tissues), the majority of which have brilliant deep blue blossoms, and grow on hills. All possess an active bitter principle in the root, but medicinal g. is derived from *G. Lutea.* Its action is due to a glucoside which increases the tone of the alimentary canal.

GENTIANACEÆ, family of glabrous herbs, rich in bitter principles; chief genus, *Gentiana,* used in distilling liquor Enzian.

GENTILES, scriptural name for people other than Jews.

GENTILESCHI, ORAZIO DE' (*d.* 1646), and his *dau.,* Artemisia G. (1590-1642), Ital. artists of eminence; both spent some time in England and were employed by Charles I.

GENTLEMAN. The term 'G.' is of very vague and shifting meaning today, but though it has almost become a politer synonym of 'man,' as 'lady' has of 'woman,' every one recognizes that properly regarded it implies something of good manners, good taste, good education, and good feeling to others. In a more usual and general sense it is applied to one of a certain social position.

GENTLEMEN-AT-ARMS, the bodyguard of the Brit. sovereign, the full title of corps being 'the Honorable Corps of Gentlemen-at-arms'; was founded by Henry VIII. as a personal guard, and recruited from young men of noble families; was originally known as 'the King's Pensioners and Spearmen,' and later as 'the Gentlemen Pensioners.' The corps now does duty at levees and other state ceremonials in the palace and consists of a captain, who must be a peer; five officers, all of whom must have held the rank of colonel or lieutenant-colonel in the army; and forty gentlemen, all of whom have held, or hold, at least rank of captain in army or marines.

GENTZ, FRIEDRICH VON (1764-1832), Ger. statesman; stirred up opposition to the Fr. Revolutionary government and sought to create a great European party against Napoleonic empire. Prussia dared not countenance his attacks, but the good effect produced by his eloquence and wit secured him subsidies from Britain and the rank of imperial councillor.

GENUFLEXION, the act of bending the knee, used especially when it is done as an act of worship at a religious service.

GENUNG, JOHN FRANKLIN (1850-1919), American clergyman and scholar. *b.* in Wilseyville, New York, Graduated from the Union College, 1870; Rochester Theological Seminary, 1875 and University of Leipzig, Germany in 1881. After filling some pulpits he was professor of rhetoric at Amherst College for 24 years, and then of Bible interpretation. Degrees: Yale, D.D.; Leipzig, Ph.D., and Union, L.H.D. Publications: *Tennyson's In Memoriam, Its Purpose and Structure,* 1883; *Epic of the Inner Life, A New Translation annotated of the Book of Job,* 1891; *Outline of Rhetoric,* 1893; *Stevenson's Attitude Towards Life,* 1901; *Hebrew Literature of Wisdom,* 1906; *The Idyll and the Ages,* 1907, and *Guide Book to the Best Literature,* 1916.

GENUS. In biological nomenclature, when several species resemble each other so distinctly that their general characters indicate relationship, they are grouped together in a G. Similar genera are grouped together to form a family. Systematic classification is as natural as possible, but it is often difficult to know where to draw the line, but in all cases the characters which distinguish one G. from another must be greater than those distinguishing the species of the genera. The family Ranunculaceæ is made up of many genera, of which *Ranunculus, Clematis, Aquilegia,* and *Thalictrum* are a few examples. They belong to one family, but differ from one another in sufficiently characteristic details, so that each may constitute a G. They are further subdivided into species; thus we have *Ranunculus aquatilis,* the water buttercup; *R. ficaria,* the lesser celandine; *R. acris,* the common buttercup, etc.

GEODESY, See GEOGRAPHY.

GEOFFREY (1158-86), Duke of Brittany; fourth *s.* of Henry II. of England, and *f.* of Prince Arthur of Shakespeare's *King John.*

GEOFFREY, DE MONTBRAY (*d.* 1093), Eng. ecclesiastic; was bp. of Coutances; prominent military figure and administrator from Conquest onwards to death of William I.; took part in rising against William Rufus, 1088.

GEOFFREY OF MONMOUTH, also known as Jeffrey Ap Arthur (*d.* 1154), an early Welsh ecclesiastic, *b.* in Monmouth, and consecrated Bishop of St. Asaph in 1152. His writings, history and fable interwoven, has had a lasting effect on literature, the most notable example of this being in Shakespeare's *King Lear.* His chief work, the *Chronicon sive Historia Britonum,* written in

about 1128, professes to be a translation of a chronicle in the British tongue.

GEOFFREY PLANTAGENET (*d.* 1151), Count of Anjou, and 1144 Duke of Normandy; second husband of Matilda, *dau.* of Henry I., and *f.* of Henry II. of England.

GEOFFROY, ÉTIENNE FRANÇOIS (1672-1731), Fr. physician and chemist; prof. of Chemistry at Jardin du Roi, of Pharmacy and Medicine and dean of faculty of Medicine at Collége de France, Paris; author of works on chemistry. His bro., Claude Joseph, chemist, made researches on essential oils in plants.

GEOFFROY, SAINT-HILAIRE ÉTIENNE (1772-1844), celebrated Fr. zoologist and comparative anatomist; famous for his contention of the homologies of parts in animals, and his general theories of anatomical relationships.

GEOFFROY, SAINT-HILAIRE ISIDORE (1805-61); Fr. zoologist; *b.* Paris; *s.* of above; doctor of med., 1829; assisted and finally succ. his *f.*; held various educational posts, including inspector-generalship of Paris Univ., 1844; founded Paris Acclimatisation Society, 1854; writings include *Histoire generale et particuliere des anomalies de l'organization chez l'homme et les animaux* 1832-37.

GEOGRAPHIC BOARD, UNITED STATES, organization invested with authority to render decision on names given to all stations and places in the United States, Alaska and insular possessions, and to fix the spelling of the same. The Board was created by executive order in 1890 under the title of the United States Board on Geographic Names, but in 1906 the title was changed to that at the head of this article, and at the same time the powers of the Board were enlarged. The purpose of the organization is to secure uniformity of usage in regard to geographic nomenclature and orthography. The Board passes on all unsettled questions regarding geographic names that arise in the departments, determines any changes that may be made, and its decisions are binding on all officials. A separate board formerly existed for the Philippines, but has now been merged into the Geographic Board. The Chairman in 1923 was C. Hart Merriam of the U. S. Department of Agriculture.

GEOGRAPHIC SOCIETY, NATIONAL, an association founded in 1899 'for the increase and diffusion of geographic knowledge.' In the almost quarter century since its organization the society has gained a membership of over 750,000. Its chief publication is the National Geographic Magazine, published monthly and aggregating annually about 1,400 pages of text and illustrations. In addition the society furnishes news bulletins free of charge to hundreds of newspapers and syndicates, thus bringing geographic information of interest and value into perhaps half the homes of the country. At intervals it publishes accurate and elaborate maps, so authentic that many of them are used by the United States army and War Department. It has inaugurated, financed and encouraged expeditions of discovery in many of the countries of North and South America, notably in Alaska, Peru and Mexico. In recognition of explorers' services, it has conferred medals and honors on Peary, Shackleton, Amundsen and Gilbert. In 1922-23 it added to its activities the preparation of a loose-leaf pictorial geography for use in the public schools.

GEOGRAPHICAL SOCIETY, AMERICAN, founded in New York in 1852. Its objects are to stimulate and encourage exploration and discovery; to disseminate geographical information by discussions and publications; to contribute to commerce and navigation and establish a center where can be gathered information concerning all parts of the world for the benefit of the public. It has a most extensive and valuable collection of books, maps and charts, that have been accumulated during its existence of over 70 years. In 1916 it helped finance the Crocker Land expedition. During the World War it published a volume on the relation of topography to military strategy in the various war zones of Europe. It issues a periodical, the Geographical Review, and has published Bowman's *The Andes of Southern Peru*, 1916, and Dominian's *The Frontiers of Language and Nationality in Europe*, 1917. In 1923 the membership of the Society exceeded 4,000.

GEOGRAPHY (Gr. *ge*, 'the earth,' *graphein*, 'to describe') has been defined as 'the exact and organized knowledge of the distribution of phenomena on the surface of the earth, culminating in the explanation of the interaction of man with his terrestrial environment' (Dr H. R. Mill). This most comprehensive science naturally divides itself into various branches, according to the different aspects of the earth's surface with which it is concerned. Thus mathematical geography deals with the earth as a planet—its figure, motions, and its place in the solar system (also known as astronomical geography); this branch also embraces the measurement of the

earth and its representation on maps, charts, etc.—(*e.g.*), geodesy, cartography, topography.

Geodesy treats of the determination of the form and dimensions of the earth, or of large areas of it; its operations consist in determining the length, azimuth, position, and altitude of a base line, usually a few miles long, the ends of which are visible each from the other, and between which the ground is level. The instruments used are of the most delicate accuracy. From the resulting triangulation is calculated the length of a meridian arc.

Mathematical geography is mainly the study of scientists and experts. Physical geography is more familiar to the average man; it occupies itself with the earth's physical features—its soil and sea and air, its climate, and kindred subjects; it bears, therefore, on such sciences as Geology, Oceanography, Meteorology.

Geomorphology describes and explains the forms into which the outer part of the earth's solid crust can be subdivided. For the geologist the structure, for the geographer the superficial configuration, is the most important aspect of the subject.

Still more familiar is *biogeography*, which investigates the earth as a home of living things; phytogeography studies the distribution, etc., of plant life and is allied to botany; zoogeography studies in like manner the animal life, and is related to zoology. Of still more human interest is anthropogeography which treats of the distribution and conditions of mankind on the earth. This, again, may be subdivided into political geography, which considers states and their boundaries, races, governments, institutions, languages, and so forth; economic or commercial geography, which relates to products, industries, routes and means of transportation, and similar matters. Geography may also be historical, applied, or practical.

Exploration and Discovery.—From the earliest times four great factors have combined to advance geography—the scientific spirit, the missionary spirit, the commercial spirit, and the adventurous spirit. The scientist in the observatory or laboratory has, from the days of Anaximander, Aristotle, Strabo, and Ptolemy, worked out and handed down, in the form of treatises and maps, the great problems of mathematical geography and other branches of the science, securing an ever more and more correct and detailed knowledge of the earth as part of the universe. The merchant, seeking new markets and fresh sources of wealth, has eagerly sought the remotest regions of the earth; and to aid him he has ever found bold mariners and intrepid explorers ready to traverse unknown seas and lands. Today exploration is still a science, a mission, a speculation, or a sport, according to the character of the explorer.

Principal Dates.—A few of the more outstanding dates in the history of geography and exploration (radiating from the Mediterranean) may be given: Egyptian expedition to Punt (Somaliland) *c.* 1600; reputed Phœnician 'periplus' or circumnavigation of Africa, B. C. 600; Anaximander's invention of maps, 580 B. C.; Hecatœus writes *Tour of the World* (first Geography) 500 B. C.; Hanno, the Phœnician, explores West African Coast, 450 B. C.; Pytheas of Marseilles reaches the British Isles, 333 B. C.; Alexander the Great enters India, 327 B. C.; Julius Cæsar traverses Europe, 60-54 B. C.; Strabo's Geography, 18; Ptolemy's Geography and Maps, 159; missionary explorations of St. Patrick, St. Columba and St. Brandan, V.-VI. cent.; Cosmas writes *Christian Topography*, VI. cent.; Norse vikings discover Iceland, 861; Greenland, 985; Newfoundland and N. America, 1000; Othere explores the Baltic, 890; Arabs visit China and East, IX cent.; Marco Polo travels in East, 1271-95; Portuguese mariners seek and find sea-route to India via Cape of Good Hope, XV. cent.; Diego Cam discovers Congo, 1484; Diaz rounds Cape, 1486; Da Gama reaches India, 1497; Spanish mariners seek westward route to India, and Columbus discovers New World, 1492; Cabot reaches Newfoundland, 1497; Pacific Ocean sighted by Balboa, 1513; first circumnavigation of world by Magellan's ship, 1519-22; Spanish Conquistadores explore South America, XVI cent.; French exploration of Canada (Cartier, 1534; Champlain, 1615), XVI.-XVII. cent.; search for North-East Passage begins (Willoughby finds Novaya Zemlya, 1553), XVI. cent.; search for North-West passage begins (Frobisher discovers Frobisher Bay, 1576), XVI cent Drake sails round world, 1577-80; Barents reaches Spitzbergen, 1596; Davis Strait discovered, 1586; Hudson Bay, 1616; Baffin Bay, 1616; Dutch discover Australia and colonize South Africa, XVII cent.; Tasman discovers Tasmania, 1642; Bering Strait discovered, 1741; Cook discovers New Zealand, 1769; interior of Africa explored (Nile, by Bruce, 1770; Niger, by Park, 1796), XVIII. cent.; North America and Arctic regions explored by Mackenzie, Ross, Parry, 1789-1829; North Magnetic Pole discovered, 1830; Lake Tchad discovered, 1822; Timbuktu,

1829; Landers finds Niger mouth, 1830; exploration of Australia by Bass, Flinders, Sturt, 1797-1831; Livingstone, Burton, Speke, Grant, Baker, explore Central Africa and discover Great Lakes, 1849-73; Burke and Wills cross Australia, 1861; Stanley finds Congo mouth, 1877; Nordenskiöld navigates North-East Passage, 1879; Younghusband enters Lhasa, the Forbidden City 1904; North-West Passage first navigated by Amundsen, 1906; Peary reaches North Pole, April 6, 1909; Amundsen reaches South Pole, Dec. 14, 1911, Scott reaches South Pole, Jan. 18, 1912.

For other important names and dates in the history of exploration, see AFRICA, AMERICA, ASIA, ATLANTIC, AUSTRALIA, EUROPE, PACIFIC, POLAR REGIONS, and other articles on various countries of the world.

GEOK-TEPE (38° 24′ N.; 57° 48′ E.), fortified town, Transcaspia, Russia; taken by Skobeleff, 1881.

GEOLOGICAL SURVEY, U. S., a bureau in the Department of the Interior, whose work it is to classify the public lands of the United States according to their geological character. The work of the Survey may be divided into three separate phases; geology proper, which has to do with the actual surveying and studying of the lands; irrigation survey, which considers the conditions of the arid regions and reports on the feasibility of subjecting them to irrigation projects or otherwise redeeming them for purposes of agriculture; and the preparation of maps, which is based largely on the work of the other two departments. As a result of the work already accomplished by the Survey, which includes investigations in practically all parts of the country, maps are issued which have proven of great value to many industries, especially in mining and engineering. These maps are of unusually large size, issued in sectional squares, some of them on a scale of four inches to a mile, so accurate that they have even been used as the basis for the settlement of boundary disputes. The work of the actual surveys may be likened to a general and continuous process of stock taking of the mineral wealth of the nation. As an instance, in 1921, when there was a profound depression in the mining industry, the Survey issued a book, *A World Atlas of Economic Geology*, in which was summed up a large amount of the data collected during the years of its work, constituting a quantitative study of the distribution of natural wealth among the various nations of the world, of immense value to economists as well as the mining industry.

GEOLOGY (Gr. *ge*, 'the earth;' *logos*, 'doctrine'), the science which investigates the past history of the earth and of its inhabitants, and especially the composition, structure, and contents of the rocky crust.

History.—In early times the operation of some of the great physical agents of nature attracted attention, and some notice was paid to minerals, rocks, and even fossils; but the observations were isolated and haphazard, and were mixed up with theories that were often whimsical and absurd. More enlightened views gradually gained ground during the 16th and 17th centuries as a result of better methods of observation and interpretation. During the later decades of the 18th cent. a great impulse was given to earth study by Werner, who presided at the Freiberg School of Mines in Saxony. Werner examined all the rocks he could in his own district, and classified them according to their mineralogical character. Owing to his regarding all rocks as being deposited on the bed of a universal ocean originally, and holding that the ocean had since subsided, he gained for himself and his followers the name of *Neptunists*.

On the other hand, Desmarest and Dolomieu, two Fr. geologists, in maintaining the volcanic origin of the rocks of S. Europe, were known as *Vulcanists*. In 1795 Hutton published his *Theory of the Earth*, which specially drew attention to the constant denudation of the earth's surface by running water and the deposition of débris on the floor of the ocean by this action. In 1797 Playfair published *Illustration of Hutton's Theory*, while the following year Sir James Hall proved that molten rock or lava gives rise to rocks assuming different aspects, dependent on the rate of cooling and the pressure to which it is subjected. William Smith, an Eng. surveyor, established stratigraphical geol., and in 1790 he published his *Tabular View of British Strata*, and a geological map of England in 1815. He classified the strata of the Secondary or Mesozoic formations by their fossils, and Cuvier and Brongniart, two Fr. naturalists, did the same with the Tertiary or Kainozoic formations.

Practical.—The term geology is a wide one, embracing as it does not only study of the actual rocks constituting the earth's crust, but also the evolution of its surface features, the building up and destruction of continents, and the tracing of the changes in the evolution of plants, animals, and human races which have peopled the earth. This latter branch of geol. can only be pursued by a study of the fossils found embedded in the various rocks and deposits. Since the introduction of life

on the earth, each succeeding period in the earth's history is marked by some peculiar type of animal or vegetable life, and it is by the fossil remains of these characteristic types that geologists are able to determine to what particular period belong the rocks in which they are found.

Geol. calls to its aid almost all other branches of science. Astron. teaches us something of the appearance and nature of the other planets; the telescope reveals nebulæ in various stages of condensation; and the spectroscope shows the exact composition of the heavenly bodies. Physics supplies data relating to the condition of matter and energy, The researches of the chemical laboratory reveal the complicated compositions of many rocks, while bot. and zool. enable fossil remains to be classified accurately. Much is, of course, to be learned from the actual arrangement of the rocks themselves, the older rocks usually underlying the newer. Their composition, arrangement, and fossil contents reveal to us the geographical revolutions of past ages, as, for instance, when the remains of an anc. marine bed are found covered by a lacustrine deposit, overlying which again are proofs of another sea, on the floor of which lie volcanic ashes, thus indicating that the original sea, having receded, had its place taken by a lake, only in turn to give way to a return of the sea at some subsequent period, followed by volcanic activity, the whole series being again uplifted to form land, and thus made accessible to the geologist who reads the riddle of their changes.

The main features of the earth's surface are determined primarily by movements of elevation and depression. When a part of the crust is raised above the ocean it is exposed to various agents of denudation, whereby the rocks are disintegrated and the products are carried, partly in solution but largely by mechanical transportation by water and other means, from higher to lower levels, and eventually to the sea. There they are laid down in beds which in course of time accumulate in thick formations, especially where the sea-flow is gradually subsiding. Shells of organisms gradually build up beds of limy or siliceous material. Owing to subsequent crustal movements these beds may be upraised to form land, and by cementation and pressure the materials are consolidated and form the *Sedimentary Rocks*, such as conglomerates sandstones, shales, and limestones.

The *Igneous Rocks* owe their origin to the operation of eruptive and volcanic forces, and are formed by the consolidation of molten magmas derived from the hot interior. Some are thrown out at the surface in the form of lava and give rise to obsidians, pitchstone, basalt, etc., or as fragmentary material yielding tuffs and breccias; others cool and solidify below the surface, and are only exposed by subsequent denudation of the overlying rocks which concealed them—granites, gabbros, and dolerites are examples. Crustal movements and the uprise of heated magmas from below bring about marked changes in the rocks of the crust. Strata are fractured, dislocated, tilted, folded, and contorted; sometimes they are displaced for miles in enormous masses and occasionally inverted. As a result of heat and pressure rocks originally sedimentary or igneous are more or less transformed, their old characters being replaced by new ones. Such rocks are termed *Metamorphic*, and include gneisses, schists, quartzites, slate, and marble. (For a more detailed account of the structure, etc., of other rocks, see separate articles thereon.)

The origin of the earth is an astronomical problem, and takes us back to the time of the nebula, which, it is supposed, condensed down and ultimately formed the solar system. Very little is known of the great interior except that it is very hot, and that it is made up of materials much denser than those which compose the outer rocky crust. This rocky crust, with its envelopes of water and air, is the only part accessible to direct observation.

The divisions are arranged in historical order, from the oldest at the bottom to the youngest at the top. By noting the order of superposition and by means of fossils it is possible to correlate the stratified formations in all parts of the world, to fix their relative age and their position in the geological record.

The oldest rocks are *Archaean* gneisses and schists, usually concealed under newer deposits, but appearing at the surface in the N.W. Highlands of Scotland, Scandinavia, Canada, and elsewhere. The schists (*Moine* and *Dalradian*) of the E. and S. Scot. Highlands are also probably *Pre-Cambrian*. *Torridon Sandstones* underlie *Cambrian* rocks in N.W. Scotland, and at a few localities in Wales and England schists, volcanic rocks, and sediments of this early age are exposed. Vague traces of organic matter in Pre-Cambrian sediments in America are thought to represent the dawn of life (*Eozoic*). Definite fossils occur in the *Palaeozoic* (ancient life)—the lowest, or *Cambrian*, system containing only the remains of marine invertebrates. These become more abundant in the *Ordovician*, and air-breathing invertebrates appear in the *Silurian*.

STRATIGRAPHICAL TABLE—THE GEOLOGICAL RECORD.

Group (*Era*).	*System* (*Period*).	*Series* (*Epoch*).
Kainozoic or Tertiary.....	Neogene.....	Recent. Pleistocene. Pliocene. Miocene.
	Palæogene.....	Oligocene. Eocene.
Mesozoic or Secondary....	Cretaceous.....	Upper Cretaceous. Lower Cretaceous.
	Jurassic.....	Upper Oolites. Middle Oolites. Lower Oolites. Lias.
	Triassic.....	Rhætic. Keuper. Bunter.
Palæozoic or Primary.....	Permian.....	Upper Permian. Lower Permian. Coal-measures.
	Carboniferous.....	Millstone Grit. Carboniferous Limestone.
	Devonian or Old Red Sandstone.....	Upper Devonian or O.R.S. Middle Devonian or O.R.S. Lower Devonian or O.R.S.
	Silurian.....	Ludlow. Wenlock. Llandovery.
	Ordovician.....	Bala. Llandeilo. Arenig.
	Cambrian.....	Upper Cambrian. Middle Cambrian. Lower Cambrian.
Eozoic or Pre-Cambrian	Torridonian Moine and Dalradian schists Archæan or Lewisian	

while near the top of this system we meet with the earliest fishes. Primitive sharks and double-breathing fishes are dominant in the *Old Red Sandstone*, and in the succeeding *Carboniferous* some vertebrates are found to have emerged out of water and evolved into amphibians. Reptilian remains appear in *Permian* strata.

GEOMETRIC PROGRESSION, a series of quantities such that the ratio of any one of them to the one immediately preceding is the same throughout the series. This ratio is called the common ratio of the series. Thus 3, 6, 12, 24...etc.; 6, -2, $\frac{2}{3}$, $-\frac{2}{9}$,...etc., and a, ar, ar^2, ar^3...etc., are series in G.P., whose common ratios are respectively 2, $-\frac{1}{3}$, and r. In the last series the nth term is arn-1 and the sum to n terms is $a \times \frac{1-rn}{1-r}$. In cases where r is less than 1, it is found that the sum of an infinite number of terms of the series is the finite quantity $\frac{a}{1-r}$. A recurring decimal is an example of such a G.P., and is hence reduced to its equivalent fraction. G.P. forms the basis on which calculations of annuities and compound interest are made.

GEOMETRY is a deductive science which treats of the properties of space. It is supposed to have had its origin in land surveying. Some methods of surveying must have been practiced in very early times, but anc. tradition said geometry originated in Egypt, where, according to Herodotus, the periodical inundations of the Nile, by altering the course of the river and destroying landmarks in the valley, rendered a fairly accurate system of surveying necessary; hence the study of the subject by the priests. Gr. geometry differed from Egyptian geometry, of which

we have knowledge, in that it was from the commencement a deductive science; the specimens of Egyptian geometry only deal with particular numerical problems, not with general theorems. The foundations of the science were laid by the members of the Ionian and Pythagorean schools of philosophy, who discovered many well-known theorems subsequently included in Euclid's *Elements*. Pythagoras proved the properties of right-angled triangles, different proofs of which are given in Euclid I. 47 and 48, besides numerous other theorems. The scholars of the Athenian school developed the science of geometry very considerably. Hippocrates of Chios wrote the first elementary text-book of geometry, and on this Euclid's *Elements of Geometry* was probably founded. Most of the theorems in Book V. of Euclid were discovered by Eudoxus, a member of the Athenian school, and his proofs were much the same as those of Euclid. Euclid (*c.* 330 275 B.C.) is famous for his *Elements of Geometry*, which has been the standard text-book for 2,000 years, though parts of it are now superseded. From the first cent. B.C. to the Renaissance, geometry made comparatively little progress, but the invention of analytical geometry by Descartes, in 1637, opened up vast new fields. The use of points and lines at infinity, which are not considered in Euclidean geometry, gave rise to modern projective geometry. In the last 300 years the science has developed on more and more specialized lines.

Geometry may be divided into several sections, not independent, but the division is convenient. (1) *Euclidean Geometry* deals with the metrical properties of space. (2) *Projective Geometry* is similar to (1), but has wider scope, due to use of principle of geometrical continuity—*i.e.*, points and lines at infinity are utilized. (3) *Analytical Geometry* applies the methods of analysis to the study of both plane and solid geometry. (4) *Descriptive Geometry* deals with the representation of solids by plane figures.

GEOMORPHOLOGY. See under GEOGRAPHY.

GEORGE I. (1660-1727), Elector of Hanover and king of Britain; succ. to Brit. throne, 1714, as grandson of Elizabeth, *dau.* of James I., on whom (and her heirs) the succession was fixed by *Act of Settlement*, 1701. His reign was marked by gross corruption and venality in public and private life; m. Sophia Dorothea of Brunswick-Celle (1682), but divorced her on charge of unfaithfulness (1694).

GEORGE II. (1683-1760), succ. to Brit. throne 1727; m. Caroline of Brandenburg-Anspach, who kept Walpole in power, despite G.'s aversion to him. Walpole ruled country till 1742. War of Austrian Succession (1740-48) and Jacobite rebellion (1745-46) occurred in this reign, which also saw beginnings of Methodist movement.

GEORGE III. (1738-1820), king of Great Britain and Ireland; succ. 1760; m. Sophia Charlotte of Mecklenburg-Strelitz, 1761. His accession interrupted continuity of politics of time. His chief adviser was Earl of Bute, who was inexperienced in politics. From first G. resolved to destroy Whig oligarchy. By bribery and corruption he constructed a party for himself, 'King's Friends.' Bute and G. thwarted Pitt's war-policy. Pitt resigned (1761). Bute's unpopular ministry (1762-63) was followed by Grenville-Bedford ministry (1763-65), famous for Wilkes's prosecution and Stamp Act. Official Whigs succeeded under Rockingham and repealed Stamp Act, but were overthrown (1766) by 'King's Friends.' Pitt-Grafton ministry followed, but Pitt's ill-health prevented achievement of his cherished schemes, and Grafton controlled Cabinet. Struggle with America was renewed. From 1770-82 North was First Lord of Treasury, and during this time G. ruled according to his own ideas. He persisted obstinately in Amer. War of Independence (1775-82), despite great difficulties. Second Rockingham administration (1782) conceded legislative independence to Ireland. Shelburne signed Peace of Versailles (1783), but his ministry soon fell before hostility of opposition. Fox formed a coalition with North, and forced on king a ministry nominally headed by Portland (1783). G., however, unconstitutionally secured rejection of Fox's India Bill; coalition resigned, and Pitt became Prime Minister.

In Nov. 1788 the king went mad. After his recovery, he united closely with Pitt. Both struggled against Fr. Revolution. France declared war (1793), which lasted with two short breaks till 1815. G. again became insane, 1801, after Pitt's resignation. Addington ministry succeeded (1801-4). Pitt died, 1806, and 'Ministry of all the Talents' (1806-7) resigned on the Catholic question. Tories were in power from 1807-30. Failure of his armies and death of Princess Amelia, Nov. 1810, caused G.'s madness to return permanently. Regency Bill (1811) made Prince of Wales practically king. G. died Jan. 29, 1820, blind, deaf, mad, having outlived his triumphs.

GEORGE IV. (1762-1830), king of Great Britain and Ireland; became

prince-regent, 1811, owing to George III.'s insanity; succ. as king, 1820. He kept Tories in office; m. Caroline of Brunswick-Wolfenbüttel, 1795, but soon separated from her; her trial, 1820, increased G.'s unpopularity. Liberal Tories joined ministry, 1822. G. had to receive Canning as Foreign Sec. and Leader of House of Commons. Canning freed Britain from Holy Alliance; Peel, as Home Sec., reformed Criminal Law. Canning's ministry (1827) was followed by Goderich's failure, and Wellington-Peel ministry (1828-30) was marked by question of Catholic Emancipation. G. was a selfish voluptuary, vacillating and unprincipled.

GEORGE V. (1865), by the Grace of God, of the United Kingdom of Great Britain and Ireland, Emperor of India; George Frederick Ernest Albert, second *son* of Edward VII.: *b.* Marlborough House, June 3. On death of his elder brother, Duke of Clarence, he became heir-apparent (1892); entered navy as cadet (1877); served on *Britannia* training ship two years; then went three years' trip round world on *Bacchante*; midshipman on *Canada* (1883); lieutenant (1885); commander of gunboat *Thrush* (1890). As Duke of York he entered House of Lords (1893), and on July 6, 1893, he married Princess Victoria Mary of Teck (now Queen Mary); their children are: (1) Edward Albert (Prince of Wales), *b.* June 23, 1894; (2) Albert Frederick, Duke of York, *b.* Dec. 14, 1895; (3) Victoria Alexandra ('Princess Mary'), *b.* April 25, 1897; (4) Henry William, *b.* March 31, 1900; (5) George Edward, *b.* Dec. 20, 1902; (6) John Charles, *b.* July 12, 1905, *d.* Jan. 18, 1919. In 1901 the Duke of York, now rear-admiral, became Duke of Cornwall (on his father's accession) and Prince of Wales (Nov. 9); set out on *Ophir* to make a colonial tour and open the first Commonwealth Parliament; in 1905-6 he visited India. On May 6, 1910, King George ascended the throne; coronation, June 22, 1911. On Dec. 12, 1911, His Majesty was proclaimed Emperor of India in person at Delhi Durbar, during what constituted the first visit of a Brit. monarch to his overseas dominions. During World War he labored incessantly for his country's good, encouraging troops on Fr. front by frequent visits, and making numerous appearances at great munition and industrial centers. In July 1917 the family name of the King was changed to Windsor by royal proclamation.

GEORGE I. (1845-1913), king of Greece; *s.* of Christian IX. (Denmark); elected in succession to Otho I., 1863; m. Grand Duchess Olga; five sons, one dau.; assassinated, 1913.

GEORGE (1832-1904), king of Saxony *s.* of King John; succ. his *bro.* King Albert (1902); distinguished for military abilities.

GEORGE, RT. HON. DAVID LLOYD (1863), Brit. statesman; *b.* at Manchester, *s.* of William George, sometime master of Hope Street Unitarian Schools, Liverpool; educated at Llanystymdwy National School and privately; qualified as solicitor (1884); began public career as militant Nonconformist; entered Parliament at fiercely contested by-election (1890) for Carnarvon boroughs, which he has since represented. In 1904-5 led the Welsh Educational agitation; president of Board of Trade in the Campbell-Bannerman administration (1905-8); chancellor of the Exchequer (1908-15); his Budget of 1909, with its novel proposals for land taxation, thrown out by House of Lords and led to general election of 1910.

On outbreak of World War he took measures which enabled Brit. credit to sustain the shock successfully; early in 1915 was appointed minister of munitions in which office he displayed organizing ability and ceaseless energy. On tragic death of Kitchener, succeeded him as secretary of war. In circumstances still obscure, he proposed small war cabinet from which the prime minister was to be excluded. After failure of attempts at compromise, resigned; and as he was supported by Unionist leaders, Mr. Asquith and his lieutenants retired. For the military events of Mr. Lloyd George's administration, see WORLD WAR. Following on the Armistice he went to the country (Dec. 1918), thereby incurring criticism for delaying the Peace Conference. He was returned to power with a huge majority, the non-Coalition Liberals being practically wiped out, only twenty-eight being successful at the polls. For his labors at the Peace Conferences, see article under that head. Other important incidents in the first half of 1920 were the introduction of a Home Rule Bill, a Budget and a new Agricultural Bill. Lloyd George in 1921 took an active part in many conferences on the political and economic conditions of Europe. In 1922 his aggressive attitude towards Turkey and a general weariness with his policies resulted in the defeat of the Coalition Cabinet by the Conservatives. He was, however returned to Parliament. He visited the U. S. in 1923. See ENGLAND.

GEORGE, GRACE (1880), an American actress; *b.* in New York. She was educated in a convent until nearly

fourteen years of age, when she made her first appearance on the stage in *The New Boy*. Shortly afterwards she began playing leading roles. Among the plays in which she has appeared as the leading woman are *The Girl I Left Behind Me*; *Her Majesty*, 1900; *The Two Orphans*, 1904; *A Woman's Way*, 1909; *Major Barbara*, 1915; and *Elevation*, 1918. She was married to William A. Brady, the theatrical producer in 1899.

GEORGE, HENRY (1839-1897), an American economist; *b.* in Philadelphia, Pa. Leaving school at the age of fourteen, he made a deep-water trip on a ship to Calcutta and Australia as a cabin boy, finally arriving in San Francisco, Cal. For some years he followed the varied occupations incidental to the unsettled conditions in California at that time, but eventually became a typesetter in a newspaper office. From this occupation he gradually drifted into reporting, thus acquiring practice in literary expression. The booming of land values in those days aroused his thought, and he began writing articles on the land question, one of which, printed first in the New York Tribune, attracted the attention of John Stuart Mill. These scattered expressions of thought first appeared in book form in *Our Land Policy*, 1871; in which is set forth the rough outline of the theory more explicitly detailed in his famous *Progress and Poverty*, 1879; the book on which he made his reputation.

GEORGE, HENRY, JR. (1862-1916), a U.S. congressman and an economist; *b.* in Sacramento, Cal., and the *s.* of Henry George. At the age of sixteen he went to work in a printer's shop, later, like his *f.* taking up newspaper work. When his *f.* went abroad on a lecture tour, in 1883, he accompanied him as secretary, later remaining abroad as correspondent for American papers. He was elected to Congress from New York for the terms 1911-13 and 1913-15. He wrote *A Life of Henry George*, 1900; *The Menace of Privilege*, 1905; and *The Romance of John Bainbridge*, 1906.

GEORGE JUNIOR REPUBLIC, a community of juveniles, founded near Freeville, N. Y., in 1895, by William R. George, as an experiment in developing a sense of responsibility in delinquent boys. The community is in all outward aspects an ordinary village, or small town, with the exception that the majority of the inhabitants are children and the voting age begins at sixteen, instead of twenty-one. The officers of the community are also juveniles, elected by their fellows. At first the children were of the class known as delinquents, but gradually the experiment, having proved successful, has been expanded to take in all classes, and is now regarded as an ordinary training school in citizenship. Similar communities have since been established in other parts of the country, usually in conjunction with schools for industrial training.

GEORGE, LAKE (also Horicon), a body of water in eastern New York, near the Vermont boundary, 36 miles from north to south and from one to four miles in width. It is connected with Lake Champlain by a narrow waterway. Its surface is dotted with numerous small islands which, with the surrounding mountains towering into peaks 2,000 feet high, give the locality a scenic beauty which has made it famous as a summer resort. A state park, five acres in extent, known as Fort George Battle Park, has been laid out along its shores.

GEORGE, ST., patron saint of England and Portugal; feast day, April 23. Historically, St. G. is a matter of some controversy; probably came from Asia Minor; lived in Nicodemia; arrested as a Christian under anti-Christian laws of Diocletian, confessed his faith, and was tortured, 303 A. D. The dragon usually associated with him is a later legendary embellishment. Canonized, 1222, and finally recognized as patron of England by Edward III. in 1349.

GEORGE THE CAPPADOCIAN (fl. 360 A. D.), abp. of Alexandria; notorious for tyranny; murdered by populace.

GEORGE, W. L. (1882), an English novelist, *b.* in London. He was educated in Paris, entered the French Army after he had left school, then tried, one after the other, the professions of chemist, engineer and lawyer, failing in all. Finally he became a journalist, where he met immediate success. His first books were economic or sociologic, but even after he began writing fiction it was obvious that he merely changed his medium to carry the same messages. At the present time he ranks with the foremost of the younger school of British novelists. Among his books are *Engines of Progress*, 1907; *A Bed of Roses*, 1911; *The City of Light*, 1912; *The Second Blooming*, 1916, and *Caliban*, 1920.

GEORGE'S CHANNEL, ST., an arm of the sea separating Ireland from Wales, south of the Irish Sea. It is about 100 miles in length, with a breadth varying from 50 to 70 miles.

GEORGETOWN, formerly the name of a city in the District of Columbia, on the Potomac river. Since 1871 it has been part of the city of Washington.

It is the seat of Georgetown University, a Catholic institution with a famous astronomical observatory. It is a town of considerable historic interest. Its chief industry is the manufacture of flour.

GEORGETOWN, a city of South Carolina, in Georgetown co., of which it is the county seat. It is on the Georgetown and Western railroad, and Winyah Bay. It has an excellent harbor and has considerable commercial importance. It is also the center of an extensive agricultural region. Georgetown is connected with New York, Baltimore and other cities by steamship lines. Its industries include machine shops, foundries, saw mills, a chemical factory, etc. It has a large export trade in rice, turpentine and lumber. There is a public library, post-office, and custom-house. Pop. 1920, 4,579.

GEORGETOWN.— (6° 46′ N., 58° 8′ W.), capital of Brit. Guiana, near mouth of Demerara, S. America; contains government buildings, Anglican and R. C. cathedrals, coll's, museum, botanical gardens; good harbor; several factories; exports sugar, coffee, timber. Pop. 53,422.

GEORGETOWN COLLEGE, a co-educational institution founded in Georgetown, Ky., in 1829, under the auspices of the Baptist Church. Its buildings are valued at about $250,000 and its productive funds amount to about $300,000. In the fall of 1921 it had a faculty of 25 and a student body of 352. The president was then M. B. Adams.

GEORGETOWN UNIVERSITY, a Catholic institution under the administration of the Jesuit Order, founded in Georgetown, D. C., in 1789. By an Act of Congress passed in 1815 it was authorized to grant academic degrees, and in 1833 it received from the Pope the right to grant degrees in philosophy and theology. It also has departments devoted to the arts, medicine, dentistry and law. In 1921-22 it had a student body of 2,471 and a faculty of 264. Its two libraries contain 128,000 volumes.

GEORGE WASHINGTON UNIVERSITY, a non-sectarian co-educational institution, founded in 1821, in Washington, D.C. It has departments of law, engineering, medicine, pharmacy, arts and sciences. It has a library of 55,000 volumes. In 1921 it had an enrollment of 4,164 students, with a faculty of 220. The total income during 1921 was $474,417.

GEORGIA (33° N., 83° W.), one of the most southerly of the United States; bounded by Tennessee and N. Carolina on N.; S. Carolina and Atlantic Ocean on E.; Florida on S.; and Alabama on W.; length, *c.* 320 miles; breadth, *c.* 250 miles; total area, *c.* 59,475 sq. miles, of which almost 500 are water. Capital is Atlanta, in N. W. interior. G. is divided, naturally, into five regions: the sea-islands—the home of the famous sea-island cotton—lying along the coast, with sand, marches, and woods—oak, palmetto, magnolia, cedar, etc.; the mainland is low and level for some 60 miles inland—with a salt marsh, near the sea—rich in soil and semi-tropical vegetation; beyond are the pine-barrens, with great forests of pitch-pine, but with numerous swamps; then come the sand-hills and fertile tracts with forests and yielding fruit, cotton, Indian corn, oats, and other cereals; the country then becomes mountainous, with fertile valleys. In N. and W. lie the Appalachian Mts. (rising sometimes to *c.* 5,000 ft.); principal rivers are the Chattahoochee (part of W. boundary), along with the Flint, constituting the Apalachicola (navigable *c.* 300 miles), which flows into the Gulf of Mexico; the Savannah and Altamaha (navigable *c.* 300 miles), flow into the Atlantic. Climate is mild and, except in lowlands and swamp regions in S., agreeable and healthy; mean temperature is 78° in summer and 47° in winter. Game is plentiful, and alligators are numerous in the rivers. See MAP U.S.

G., which is named after George II., was founded by James Oglethorpe (*c.* 1733) as a place of refuge for poor debtors and religious refugees, but failed in this object; it succeeded, however, in its aim of protecting N. and S. Carolina from the Spaniards and French. G. adopted the Constitution of U. S. in 1788. Before Civil War G. joined S. Confederacy; rejoined Union, 1868.

About 70 per cent. of the country is farmland, largely worked by negroes. G. is the second largest producer of cotton in U. S. A.; it is also the greatest grower of sea-island cotton; cereals are cultivated in N. regions, the chief being corn and wheat; rice is grown near the coast; the cultivation of sugar-cane is increasing; tobacco is grown; much fruit—oranges, melons, grapes, pineapples, peaches, and bananas—is grown, and, along with market vegetables, exported to the N.; large pine forests cover *c.* 42,000 sq. miles of land; and fisheries—belonging to the State—are of importance, especially oysters and shads. G. is rich in minerals, including gold, silver, coal, iron, and manganese ores; marble and other quarries are worked, and mineral springs occur.

Chief manufactures and industries

are extensive cotton and woolen manufactures; iron and steel trades, lumber, timber-planing, flour and grist milling. Lumber and naval stores are shipped from Savannah, Darien, Brunswick, and St. Mary. Savannah (with a population of 83,252) is the chief port; other cities are Atlanta, 200,600; Augusta, 52,548; Macon, 52,995; Columbus, 31,125; Athens, and Brunswick. G. is divided into 146 counties; and is represented in Congress by two senators and eleven representatives. There are many schools and academies in G. and a Univ. of G. at Athens. In religion Baptists and Methodists predominate. Pop. 1920, 2,895,832.

GEORGIA, republic of Transcaucasia (41° N., 45° E.), between the Caucasus Mts. and Armenia; cap. Tiflis; chief port, Batum; area, about 30,000 sq. m.; pop. about 3,053,000. Formerly a separate kingdom, it was annexed to Russia, 1801; its independence was recognized by the Russian Bolsheviks, Aug. 27, 1918, and subsequently it became a republic. The land was confiscated and nationalized, with compensation to owners, and Russians were dismissed from government posts. The Georgians pursued an ambitious policy which brought them into collision especially with the Armenians. In 1921 the country came under the domination of the Russian Soviet government. They are a Christian community. Their territory includes splendid forests and rich mineral regions.

GEORGIA SCHOOL OF TECHNOLOGY, a state institution founded in 1888, at Atlanta, Ga., devoted to the higher technical education. State appropriations for its support, together with tuition fees, amounted to $230,000 in 1921. In the fall of that year the students numbered 1,850 and the faculty 100. The library contains 15,000 volumes.

GEORGIA, UNIVERSITY OF, a state institution, founded in 1901, at Atlanta, Ga. Its library contains 62,000 volumes. In the fall of 1921 it had enrolled 1,230 students and a staff of professors and instructors numbering 90. The president was then David C. Barrow.

GEORGIAN BAY (45° 25′ N., 81° W.), N. E. portion of Lake Huron, separated from main body of lake by Manitoulin Island and Cabot's Head.

GEORGIOS MONACHOS, GEORGE THE MONK (IX. cent.), Byzantine writer; compiled a chronicle dating from the earliest times to his own period.

GEPIDÆ, a people of Germanic origin, whom we first read of in ancient history as having settled about the mouth of the Vistula in the 3rd century. They migrated to the Lower Danube in the 4th century, and were subjugated by the Huns, but recovered their freedom on the death of Attila, King of the Huns, and established themselves in Dacia. Here they grew very powerful, and it was to check their inroads that the Emperor Justinian invited the Lombards to occupy the Roman provinces between the Danube and the Alps. They found a powerful enemy, however, in the Ostro Goths at the end of the 5th century, and in 566 sustained a crushing defeat from the Lombards and Avars. The latter seized their lands, and they were gradually extirpated.

GERA (50° 52′ N., 12° 5′ E.), town, Reuss (the Younger), Germany, on White Elster; textile industries. Pop. 1919, 73,660.

GERANIUM, largest genus of natural order *Geraniaceæ,* annual and perennial herbs found throughout the temperate regions. In Brit. Isles eleven species known as *crane's-bill* are found. The commonest is Herb Robert, *G. Robertianum* of the hedgerows. Leaves are palmately lobed, flowers regular, 5 sepals, 5 imbricating petals, 10 stamens, and a beaked ovary. Many handsome garden plants exist, but the commonest 'geraniums' are really pelargoniums.

GERARD (fl. XI. cent.), organizer of Knights of St. John of Jerusalem. G. was the administrator of the Hospital of St. John at Jerusalem and was first Grand Master.

GÉRARD, ÉTIENNE MAURICE, COUNT (1773-1852), distinguished Fr. soldier; Minister of War and a marshal of France after 1830.

GERARD, FRANÇOIS PASCAL, BARON (1770-1837), a French painter, *b.* in Rome. He entered the Pension du Roi at Paris at the age of twelve, and from there went to the studios of Pajou, the sculptor, and Brenet, the painter, whom he left shortly to study under David. He competed for the Prix de Rome in 1789, but was unsuccessful. Two years later he again presented himself, but his father's death prevented the completion of his work. He then went to Rome for a year, but returned to Paris in 1791, and obtained employment under his former master, David. In 1776 he painted his famous 'Bélisaire,' and the following year 'Psyché et l' Amour.'

GERARD, JAMES WATSON (1867), an American diplomat, *b.* in Geneseo, N. Y. He graduated from Columbia

University in 1890 and from the New York Law School in 1892. During 1908-12 he was associate justice of the supreme court of New York. In 1913 he resigned upon his appointment as Minister to Germany. Upon the breaking of diplomatic relations between the United States and Germany, in February, 1917, he was recalled, and shortly after retired from the diplomatic service to resume his private law practice. He has written two books covering his experience in Berlin; *My Four Years in Germany*, 1914, and *Face to Face with Kaiserism*, 1918.

GERARD OF CREMONA (1114-87), the mediaeval translator of Ptolemy's astronomy. He studied ancient wisdom in the Spanish and Moslem schools of Toledo, and having acquired a knowledge of Arabic, devoted the remainder of his life to the making of Latin translations from its literature. His most celebrated work is the translation of Ptolemy's *Almagest*. He is also said to have translated about sixty-six other treatises. He died at Cremona in Lombardy.

GÉRARDY, JEAN (1877), Belgian violoncellist; made his first appearance in Britain, 1888, on tour with MM. Ysaye and Paderewski; has also appeared in America and Australia, and is considered one of the greatest living 'cellists.

GERASA, modern Jerash (32° 17′ N., 35° 57′ E.), ancient city, Palestine; important place, II. and III. cent's.

GERBERT, MARTIN (1720-93), Ger. writer and theologian; prince-abbot of St. Blasien, 1764; wrote *Scriptores ecclesiastici de musica sacra.*

GERGOVIA, modern Gergovie (*c.* 45° 40′ N., 3° 10′ E.), ancient town, Auvergne, France; besieged by Cæsar, 52 B. C.

GERHARD, JOHANN (1582-1637), Ger. Prot. theologian; prof. of Theology, Jena, 1616; wrote *Loci communes theologici, Meditationes sacrae.*

GERHARDT, KARL FRIEDERICH (Charles Frederic) (1816-56), a famous French chemist, native of Strassburg. He studied under Liebig at Giessen, and with Chevreul, and translated several works of Berzélius and Liebig. He went to Paris, and in collaboration with Laurent and Cahours contributed to the *Annales de chimie et de physique.* With Cahours he wrote a memoir on essential oils, embodying new theories. G. was professor at Montpellier, 1844-48, and then returned to Paris, the greater part of his work being done in that city. In 1855 he became professor of chemistry at Strassburg.

GERHARDT, PAUL (1607-76), Ger. Lutheran hymn-writer; author of 123 hymns, among which are 'Wach auf mein Herz, und singe,' and 'Befiehl du deine Wege,' trans. by Wesley in 'Commit thou all thy griefs.'

GERIZIM (31° 12′ N., 35° 16′ E.), hill, Samaria; alt., 2,850 ft.; Joshua's Mountain of Blessing; Samarian chief temple.

GERMAIN, ST. See ST. GERMAIN.

GERMAN ALIENS. See ALIEN ENEMY.

GERMAN BAPTIST BRETHREN. See BRETHREN, CHURCH OF THE.

GERMAN BRETHREN, Amer. sect, found in Pennsylvania, Maryland, and other states; first established in Germany in 1708 by Andrew Mack and several of his disciples; owing to persecution, members fled to Netherlands, afterwards sailing to Pennsylvania; first Amer. congregation at Germantown, Penn., 1723. Sect has been much subdivided.

GERMAN CATHOLICS, religious denomination, seceded from Rome, 1844, led by Czerski and Ronge; subsequently banished from Austria, while they suffered from various restrictions in Saxony, Prussia, and Baden. About 1859 many united with 'Free Congregations,' others having already returned to Rome. G. C. are now found only in Saxony.

GERMAN COLONIES IN AFRICA. See AFRICA.

GERMAN EVANGELICAL CHURCH. See EVANGELICAL CHURCH.

GERMAN LANGUAGE, German is spoken by some 60 millions besides 10 millions in Austria and 2½ millions in Switzerland. German is an Aryan tongue, belonging to the group that embraces English, Dutch, Danish, Norwegian, and Swedish. In Germany the main division is between the official High Command and the Low German of the Baltic littoral. Middle Low German had no literature to speak of, but in recent times Platt-deutsch has been used by dialectal writers like Fritz Reuter. Old High German was marked by a second sound shifting (*c.* 600), which distinguished it not only from E. Teutonic, but from other W. Teutonic speeches: thus *t* became *z, tz, s, ss*; *p* became *pf, f, ff*; *k* became *ch*; *d* became *t*. Old High German had various dialects of its own—still traceable. Upper German (Oberdeutsch) was spoken in Switzerland, Bavaria, etc.; Fraconian, in Rhineland, etc. Upper and Middle German (spoken in Middle Germany—comprising Fran-

conian, Thüringian, etc.), are together called High German.

Absence of national union retarded the evolution of a uniform national speech. Luther and his Bible (1531) established High German as modern standard German; Old Prussian, akin to Lithuanian, was supplanted by German in 17th cent. Adoption of German in place of Latin as academic tongue in universities gave great impetus to native language; growth of national literature and national feeling gave it definite form and ensured unity for written and cultured German. The purest German, it is said, is spoken in Hanover. Recent tendency is to expel foreign (especially French) words in favor of Teutonic—(*e.g.,*) *trottoir* being replaced by *Burgersteig, billet* by *Fahrkarte.* German has retained power of compounding words largely lost by its cousin English.

GERMAN LITERATURE. History of German literature is usually treated under three main heads, in reality, periods of time in which linguistic, cultural, and literary conditions of one period are differentiated from those of another with sufficient sharpness to give to each period its own characteristic qualities. These periods are characterized as (1) Old High German, from the first beginnings of literary culture till the time of the first crusader, roughly speaking, till the year 1100 A.D. (2) Middle High German, from 1100 to 1348, the year in which the first German university was founded. (3) New High German, from 1517, the year in which Martin Luther placarded the church doors of Wittenberg with his ninety-five theses in protest against the sale of indulgences by the church, to the present time. In this division of literary periods a break appears from the year 1348 to 1517. It is a time of changing social and cultural conditions; the language is undergoing a slow change; literature is at a low ebb.

Christianity, and with it literary culture, came to Germany through the Roman church. It was but natural, therefore, that the early literature should reflect its source. The greatest monuments of this period, the Old High German, are *Der Krist* (The Christ) by the monk Otfried, and *Der Heliand* (The Saviour), an Old Saxon epic by an unknown author. More important than these monkish works, however, as an indication of the type of poetry that was really indigenous are the fragmentary *Song of Hildbrand* and the *Song of Waltharius*, the former written in the original Germanic alliterative verse, the latter preserved to us in Latin hexameters by the hand of a monk.

The Middle High German period shows marked cultural advancement. Christianity has become, formally at least, the prevailing religion; the feudal system is well developed. As a result we find a fairly homogeneous culture, more settled social conditions and, on the surface at least, more refinement of manners and customs. The period may be defined as one of idealism, notwithstanding the hardness and grossness of life that were certainly prevalent.

The greatest popular epic poems of this period are the *Nibelungenlied* (Song of the Nibelungs) and *Gudrun*, poems whose authors are not known. They had their origins in both myth and history, and passed for centuries from singer to singer before receiving written form. The *Nibelungenlied* is by far the most powerful piece of literature produced in the Middle Ages; it is justly compared with Homer's *Illiad.* In contrast to these popular epics are the court epics, which had their origin in the Arthrian cycle of legends which had come originally from southwest, that is, Celtic, Britain, reaching Germany by way of Brittany through the French literature. The greatest of these court epics is Wolfram von Eschenbach's *Parzival*; second to this is Gottfried von Strassburg's *Tristan und Isolde*, after which are to be classed the epics of Hartmann von Aue, *Erek* and *Iwein*, and *Der Arme Heinrich* (Poor Henry) and *Gregorius* (St. Gregory), the last two taken from legendary sources.

In this same period, about the year 1200, German lyric poetry rose to rare excellence. It is commonly known as the *Minnesang* (love song), though by no means limited to love themes. This poetry, like the epic of the same period, had its source in part in the popular song, the *Volkslied*, and in part in the idealism of chivalry. In the multitude of these poets, of whom something like 150 are known to us, the name of Walter von der Vogelweide stands out preeminent. He is perhaps the greatest lyric poet of the Middle Ages, a master in musical verse, spontaneous and true in his response to life.

From the middle of the thirteenth century onward German literature went backward. Humanitarianism began to displace chivalry. The city with its more collective interest, began to supplant the feudal lord as a center of power, but it was not able to bring forth or find a new ideal which might serve as a source of literary inspiration.

The year 1517 brought the beginning of the Reformation. From the standpoint of literature the result of central importance was Luther's translation of

the Bible into German (1521-34), a work that has been of the same fundamental importance for the development of the German language and literature that the King James version has been or our own. A second great contribution that grew to literature out of the Reformation was, and is still, found in the hymnal of the Lutheran church, whence many hymns have found their way to our own Protestant hymnals.

The seventeenth century brought the Thirty Years War (1618-48). Germany was the battle-ground of Europe and endured endless sufferings. Nevertheless, poetry received some impetus from the writings of Martin Opitz (1597-1639). The philosopher Leibnitz exerted a considerable influence upon the thought of his time. The novel *Simplicissimus*, by Grimmenlshausen, gives a vivid picture of the horrors wrought by the war. Friedrich von Logau is of interest to us because of Longfellow's translations of some of his epigrams, for example, *The mills of the gods grind slowly.*

When Germany was to a certain extent recovered from the desolation of the Thirty Years War it found the two new great national literatures in existence, the English and the French. For a time German writers turned to these literatures for their models, at first to the French, then to the English. In the end came the classical period of German literature (1748-1832), when the great German writers gave expression to their own personalities and ideals in works characterized by great perfection of form and deep ethical import. The most important works of this period can be found in English translation in the Bohn Library.

The leading names of the early classical period are Klopstock (1724-1803), Lessing (1729-81), Wieland (1733-1813) and Herder (1744-1803). Klopstock wrote the *Messias* (The Messiah), a religious epic poem, and many odes characterized by a spontaneity and freshness before lacking in the rather pedantic poetry of the time. Lessing exercised a far-reaching influence as scholar, critic, and poet. In his *Laokoon* (1766) he defined the sphere and nature of literary art as distinguished from the pictorial and plastic arts. He wrote the first modern German dramas, *Minna von Barnhelm*, a comedy, *Emilia Galotti*, a tragedy, and *Nathan der Weise* (Nathan the Wise), the first German drama in blank verse. Wieland's many novels and poems showed the French-loving aristocracy that the German language lent itself quite as well as the French to very readable works of literature. At this time, too, the great philosopher Immanuel Kant (1724-1804) was writing the works which exercised a profound influence on his and succeeding generations of all Europe. The ground was now broken for the great works of Goethe and Schiller.

Johann Wolfgang von Goethe is the preeminent figure in German literature, and the outstanding literary personality of Europe since Shakespeare. His first important work, *Goetz von Berlichingen*, 1773; a drama, is a glorification of virile simplicity of character combined with nobility of spirit. In form it is free to excess. His first novel, *Die Leiden des jungen Werther* (The Sorrows of Werther), is surcharged with emotion running into hysterical sentimentality. They show the typical excesses of the so-called Storm and Stress movement, of which *Goetz* is regarded as the first work. Goethe soon outgrew the tendencies expressed in these works. His later ideal was the attainment of poise and inner dignity through self-culture.

Goethe's greatest dramas are *Faust*, *Iphigenie*, and *Torguato Tasso*. The first part of *Faust* is a tragedy of love combined with that of a man groping blindly after the ideal values of life. In the second part of *Faust* the hero strives to realize these ideal values through self-culture—Goethe's own ideal—and finally finds them in service for others, self-renouncing, though tinged with selfishness. Through the entire two-fold drama runs the minor theme of the sanctifying influence of pure womanhood. *Faust* was the work of a life-time. Begun in 1773, it was finished in 1831. *Iphigenie*, 1787, has as its main theme the divinely beneficent influence of unstained womanhood. *Tasso*, 1790, is a poetic and dramatic symbol of Goethe's own struggles to attain the inner poise which he considers the essential element of personal culture. *Hermann und Dorothea*, 1797, an idyl of middle-class life exercises a perennial charm.

Goethe's songs and ballads are characterized by that simplicity of form and spontaneity of feeling which make them almost incapable of strict analysis, and which represent the highest excellence of lyric poetry. In his very important prose works, *Wilhelm Meisters Lehrjahre*, 1796, begun in 1776, and *Wilhelm Meisters Wanderjahre*, 1821, final form 1829; *Wilhelm Meister's Apprenticeship* and his *Years as a Traveling Journeyman*, Goethe portrays the development of a life from the first vague gropings of childhood, through the errors of youth, into a manhood of service for and with others.

Inseparable from the life and works of Goethe are the life and works of Fried-

rich von Schiller (1759-1805). A close relationship of friendship and literary intimacy existed between the two great poets from 1794 till the time of Schiller's death. Schiller's first dramas, *Die Rauber* (The Robbers), 1781, *Fiesco*, 1783; *Kabale und Liebe* (Love and Intrigue), 1784, belong essentially to the Storm and Stress movement. They are more remarkable for their vigor and verse than for their excellency of form and thought-content. In his next drama, *Don Carlos*, 1787, Schiller began his transition to mastership. From now on his dramas are written in verse; they are *Wallenstein*, in three parts, *Maria Stuart*, *Die Jungfrau von Orleans* (The Maid of Orleans), *Die Braut von Messina* (The Bride of Messina), and *Wilhelm Tell*. Schiller's dramas have been a cherished possession of the German stage for well over a century.

An equally cherished heritage from Schiller is contained in his many poems and balads. If we reduce the thought-content of the poet's dramas and poems to their simplest form we may say that they emphasize the positive worth of ideal values in life. Schiller produced also important historical and philosophical works.

A new tendency, the Romantic Movement, had begun to make itself felt in German literature even during the active literary period of Goethe and Schiller. The prose writers of this school left nothing of enduring importance. Workers in the field of scholarship, however, accomplished results of lasting value. The brothers Grimm established the modern science of linguistics on a firm basis; to them we are indebted also for the collected folk-tales which bear their name. Clemens Brentano and Achim von Arnim performed a similar service for poetry and music by collecting folk-songs. A. W. von Schlegel gave Germany a masterful translation of Shakespeare's works. The very justifiable patriotic stimulus brought about by the Napoleonic oppression called forth many deeply conceived patriotic songs; the best of these came from Arndt, Schenkendorf, and Theodor Körner.

A type of drama known as the *Fate Tragedy* was much in vogue at the beginning of the nineteenth century. It was founded on false esthetic and ethical conceptions and soon passed away.

Later works will be considered from the standpoint of type rather than of schools. The most enduring work in drama was done by Friedrich von Kleist (1776-1811), Friedrich Hebbel (1813-63), and the Austrian Franz Grillparzer (1791-1872). Kleist's great work *Prinz Friedrich von Hamburg* will probably hold a place permanently on the German stage. Hebbel is a forerunner of Ibsen as a writer of problem plays. Grillparzer stands in many respects nearer Goethe and Schiller than any dramatist of the nineteenth century. Hauptmann and Sudermann are too near us for a proper perspective; they will undoubtedly appear less important in the future than they do at present.

Prose writers most worthy of note are Heinrich Heine, Theodor Storm, Wilhelm Raabe, Paul Heyse and Peter Rosegger, writers of short stories. Gustav Freytag and Felix Dahn are appreciated for their historical novels. The most popular German humorist was Fritz Reuter, who wrote in the low German dialect. The two Swiss novelists, Gottfried Keller and Konrad Ferdinand Meyer, wrote German novels that will be read for many years to come.

In lyric poetry the name of Heinrich Heine is second only to that of Goethe; in ballad poetry this honor falls to Ludwig Uhland. Heine's *Buch der Lieder* (Book of Songs), 1827, has given to the German people their most deeply cherished songs. Joseph Freiherr von Eichendorff's poems have also many of them been composed and remain very popular. The poems of Friedrich Rückert are widely read. Joseph Victor von Scheffel wrote many popular student songs as well as a charming idyl, *Der Trompeter von Sackingen*.

Since Kant the most influential of the German philosophers have been Fichte, Schelling, Hegel, Schopenhauer and Nietzsche. The works and enduring worth of the latter have probably been considerably overestimated.

Richard Wagner is the creator of the modern 'music-drama.'

Till Germany has recovered from its present distraught state, with unsettled political, economic, and social conditions, it is not probable that its writers will produce works of great permanent value.

GERMAN PROPERTY IN THE UNITED STATES. See ALIEN ENEMY.

GERMAN SILVER, or **NICKEL SILVER,** an alloy consisting approximately of six parts copper, three parts zinc, and one part nickel, with sometimes a trace of iron. It forms a white, tough metal, taking on a good polish, and is largely used for the manufacture of spoons, forks, and other similar articles, but as it soon tarnishes it is usually electro-plated. G.S. has a high electrical resistance, and is largely used for making resistance coils.

GERMAN SOUTH-WEST AFRICA, CONQUEST OF. Shortly after the outbreak of the World War the S. African government began preparations for a campaign against German S.W. Africa. About Aug. 10, 1914, the Germans retired from their coast towns of Swakopmund and Luderitz Bay (Angra Pequeña) to the inland cap. of Windhuk. On Sept. 18 a S. African force landed and occupied Luderitz Bay, and the enemy in retaliation seized the isolated Brit. port of Walfish Bay. The outbreak of the S. African rebellion necessitated the suspension of operations, which were resumed at the end of the year, when General Botha himself took command of the expeditionary force in the field. Walfish Bay had been recovered on Christmas Day. Brigadier-gen. Van Deventer, in command of a force based upon the Orange R., marched N. towards the railway from Luderitz Bay. Colonel Berrange pushed W. from the frontier at Rietfontein. General Sir Duncan Mackenzie swept E. along the railway from Luderitz Bay through Great Namaqualand. These three forces converged on Keetmanshoop, while General Botha, who had landed at Swakopmund on Feb. 12 advanced along the railway from that point through Damaraland to Windhuk. Headway was slow at first. Mackenzie occupied Garub (Feb. 19) and Aus (March 30), while five days later Van Deventer captured Warmbad, and by a forced march of nearly 150 m. reached Keetmanshoop (April 20), where he was quickly joined by Mackenzie's and Berrange's forces, and the whole turned N. under the command of Smuts. On May 5 Botha's troops entered Karibib, and seven days later reached the capital at Windhuk, which the Germans transferred N. to Grootfontein. After a halt for refitment, the direction of the advance was turned N. along the railway from Karibib to Otavi and Grootfontein, preceded by flanking columns under the command of Brits and of Myburgh. By means of remarkable night marches Otavi was reached on July 1, and five days later Brits came into contact with the Germans at Namutoni, N. of the railway, and prevented their withdrawal to the Port. colony of Angola. Thereafter the enemy was shut in by a ring of Brit. troops. Botha demanded immediate and unconditional surrender, and after a vain attempt to make terms, the Germans capitulated at Kilo (July 8). The Ger. troops who surrendered numbered 3,497, of whom 204 were officers. The total invading force was about 50,000, of whom 27,500 were British; and the total casualties amounted to 1,189,140 representing the deaths from all causes.

GERMANICUS CÆSAR (15 B.C.-19 A.D.), Rom. gen.; *s.* of Claudius Drusus Nero; adopted by, and served under, Tiberius; became consul, 12 A.D.; subsequently commanded eight legions on Rhine, distinguishing himself against Germans; rousing Tiberius' jealousy, was sent to E. to settle disputed succession in Parthia and Armenia; death probably due to poisoning.

GERMANIUM, rare metal, similar to the series carbon, lead, silicon, and tin; discovered (1886) by Winkler in argyrodite at Freyberg, Saxony. G. has been shown to be the hypothetical element *ekasilicon.*

GERMS. See DISEASE; DISEASE GERM, THEORY OF.

GERMANTOWN, formerly a village in Philadelphia co., Pa. Since 1854 it has formed a part of the city of Philadelphia. It has much historic interest. It was settled in 1684 by Germans under a grant from William Penn, and here on October 4, 1777 took place the famous battle of Germantown between the American army under Washington and the English army under General Howe. After a severe struggle the Americans were defeated. The losses inflicted on either side were about equal. There are many handsome residences, a historical society building, Friends' School, St. Vincent's Seminary, and Stevens School.

GERMANY, OR DEUTSCHES REICH, Central European Commonwealth (47° 30′-55° N., 6°-22° 30′ E.), comprising 25 republican states; bounded on N. by North Sea, Denmark, and Baltic Sea; on E. by Lithuania and Poland, which, with the free city of Danzig, separate E. Prussia from the rest of Germany; on the S. by Czecho-Slovakia, Austria, and Switzerland; on the W. by France, Luxemburg, Belgium, and Holland. The N. forms part of great European plain, the S. generally is hilly. Important rivers flowing N. are the Pregel in E. Prussia; Oder, with Warthe trib., to Baltic Sea; Elbe, with Havel and Weser, to North Sea; middle course of Rhine, with Main Ruhr, etc., of special value; Danube, rising in Black Forest, of small commercial importance. Lakes on Baltic seaboard and Alpine forelands; large fresh-water lagoons (*haffs*) at mouths of Niemen and Oder; islands of Usedom and Wollin almost close entrance to Oder. North Sea coast fringed with sandbanks and chain of islands; Baltic coast higher, with chalk cliffs. Climate varies from equable in N. W. to extreme in E.; rainfall is moderate except on

highlands (Berlin, 23 in. Brocken, 66 in.); lakes and large rivers of N. frozen in winter; Baltic seaports sometimes closed by ice. Agriculture is chief occupation on plain; large holdings in N., smaller in S. At outbreak of World War nearly ten million people were employed in agriculture, but the percentage so engaged had fallen steadily since 1871, while the cultivated area and yield have increased. Rye, wheat, barley, oats, and potatoes are the principal crops; hops in Bavaria, rape in Prussia, flax and tobacco are also grown. The most important root crop is sugar-beet in dist. W. of Magdeburg, a center for the manufacture of sugar, of which Germany, with over 2,000,000 tons, was the largest producer. Scientific agriculture, based on artificial fertilizers, is intensively practiced; agricultural schools have been established; co-operation encouraged, and land banks organized. Fruit, especially grapes, succeed best on the hill slopes of the middle Rhine. There are many large forests.

The most important mineral products are coal, iron, and zinc. Coal is mined round Aachen, in the Rhenish and Westphalian basin (Ruhr valley), in the Saar basin (at present occupied by France), in Saxony, and in Lower and Upper Silesia (the Upper Silesian coalfield lies in the Plebiscite area); lignite is abundant. The iron-ore deposits in the hilly ground where Westphalia, Rhineland, and Hesse-Nassau meet, in Silesia, and in Saxony, are most important. Zinc is obtained near Aachen, in Upper Silesia, Black Forest, and Harz Mts. Other minerals are lead, tin, silver, bismuth, antimony, nickel, cobalt, and copper. Rock salt is abundant, especially at Stassfurt in Saxony, where it yields large quantities of potassium salts, largely used in agriculture. Amber is obtained on Baltic coasts; lithographic stones from the Franconian Jura.

In addition to industries directly dependent on agriculture and mining, Germany has large textile manufactures in the Ruhr basin, where woolens and silks predominate, in Silesia (woolens), in Saxony (cottons); shipbuilding and marine engineering are important at seaports, especially Stettin. Other industries include clockmaking (Black Forest); porcelain (Meissen), making of pianos and scientific instruments; the chemical industries center in Saxony and Westphalia.

Foreign commerce was very large at outbreak of war. Imports were chiefly (1) raw materials—viz., cotton, rubber, silk, jute, copra; (2) commodities that could be produced more easily abroad—viz., corn, tobacco, cotton and woolen yarn, machinery, and silk goods; (3) goods to supplement home supplies—viz., wool, food-stuffs, copper, hides, sawn timber. The colonies did not fulfil expectations, hence Germany's penetration through Turkey towards Persian Gulf. To secure markets for her products she adopted the policy of dumping abroad, while following a protectionist policy at home. Her largest exports were manufactured goods of all sorts. Communications are best in Europe; railway mileage, 1916, was 40,255 (of which 1,320 were in Alsace-Lorraine); mercantile fleet, 1914, had a net tonnage of 3,320,071, second largest in world; of navigable waterways and canals there were (1904, latest available figures) about 8,500 m. Berlin is the cap.

The population was estimated at 59,857,283 in 1919, when 11,803 emigrated; the war losses are estimated at 2,000,000 killed and 718,000 missing; as a result of the Treaty of Versailles the pop. was reduced by *c.* 8,000,000 and the area by *c.* 35,000 sq. m.; the area now is *c.* 174,000 sq. m.

Government and Constitution.—In 1871 the constitution of Ger. Empire was established; under it the King of Prussia was Ger. emperor, while the states were represented by two houses, the Bundesrath (chosen by the governments of the states) and the Reichstag (representing the people); the power of the emperor was practically unlimited; he nominated the president of the Bundesrath, who was imperial chancellor and responsible to the emperor alone. After the abdication of the emperor, Nov. 9, 1918, the empire became a republic; its constitution, which was adopted in July, 1919, provides for central and state legislatures, foreign relations, defense, customs, and railways being reserved for the central authority; the Reichsrath, or Imperial Council, is composed of representatives of all states (which are republics); franchise is universal, equal, direct, and secret; members of the legislative Reichstag are elected for four years; the president, elected for seven years, is chosen by whole Ger. people.

Education is compulsory and free from 6 to 14, and almost uniform throughout the empire; it is of a very high standard. Elementary schools (Volksschulen) are maintained by local taxation with state aid. Secondary schools include Fortbildungsschulen (evening continuation classes), Bürger- and Höhere-Bürgerschulen—(*i.e.*,) intermediate schools, and various Gymnasien (preparing for univ. and learned professions). In Realschulen modern languages take the first place; there are 21 state universities, and numerous special schools and colleges (some degree-granting); Polytechnic (notably at Charlottenburg, Karlsruhe,

GERMANY
Scale of Miles
0 20 40 60 80 100 120 140
Railroads
Capitals
Sovereignty to be decided by plebiscite
The World Syndicate Company, Inc., N.Y.
Longitude 12° East from 14° Greenwich
NORTH SEA
BALTIC SEA
SWEDEN
COPENHAGEN
Malmo
BORNHOLM
Memel
Konigsberg
Pillau
Tilsit
Insterburg
Pregel R.
Eydtkuhnen
EAST PRUSSIA
Danzig
Gulf of Danzig
Gulf of Curisches Haff
Stolp
Rugenwalde
Kolberg
Koslin
Stralsund
Rugen
Greifswald
Stettin
Swinemunde
Oder R.
POMERANIA
Lubeck
Wismar
Rostock
Hamburg
Altona
Kiel
Kiel Canal
Eckernforde
Flensburg
Tondern
Esbjerg
Ribe
Skagerrak
Helgoland
Cuxhaven
Wilhelmshaven
Emden
Leeuwarden
Groningen
FRISIAN ISLANDS
Zuider Zee
Amsterdam
Hague
Rotterdam
Utrecht
Arnhem
Nijmegen
Zwolle
Deventer
Oldenburg
Bremen
Luneburg
Uelzen
Hanover
Minden
Osnabrück
Munster
Enschede
Hengelo
Almelo
Lingen
Meppen
Ems R.
Weser R.
Elbe R.
Aller R.
Leine R.
Ruhr R.
Lippe R.
Dortmund-Ems Canal
Mittelland Canal
Elbe-Trave Canal
Elbe-Lubeck Canal
Antwerp
Brussels
Belgium
Liege
Namur
Charleroi
Mons
Lille
Roubaix
Tourcoing
Ghent
Bruges
Ostend
Dunkirk
Calais
Boulogne
Dover
Strait of Dover
English Channel
Dieppe
Rouen
Le Havre
Seine R.
Paris
Versailles
Orleans
Loire R.
Nantes
Brest
Cherbourg
Caen
Bayeux
Falaise
Alencon
Le Mans
Tours
Poitiers
Limoges
Bordeaux
Gironde R.
Garonne R.
Toulouse
Montauban
Agen
Perigueux
Angouleme
La Rochelle
Rochefort
Saintes
Cognac
Niort
Nantes
Angers
Saumur
Vendee
Bay of Biscay
Pyrenees
Biarritz
Bayonne
Pau
Lourdes
Tarbes
Carcassonne
Narbonne
Montpellier
Nimes
Arles
Marseilles
Toulon
Nice
Monaco
Mentone
Cannes
Grasse
Draguignan
Hyeres
Corsica
Sardinia
Mediterranean Sea
Rhone R.
Saone R.
Lyons
Grenoble
Chambery
Modane
Mont Cenis Tunnel
Turin
Alessandria
Genoa
Spezia
Leghorn
Pisa
Florence
Rimini
Ancona
Adriatic Sea
Po R.
Milan
Bologna
Ravenna
Venice
Trieste
Gulf of Trieste
Fiume
Adelsberg
Laibach
Villach
Klagenfurt
Tarvis
Brenner Pass
Innsbruck
Bozen
Trent
Verona
Mantua
Brescia
Bergamo
Lake Como
Lake Garda
Lake Maggiore
Lugano
Bellinzona
Chiasso
Simplon Tunnel
Martigny
Lausanne
Geneva
Lake Geneva
Berne
Basel
Zurich
Lucerne
Lake Lucerne
Lake Constance
Bregenz
Feldkirch
Chur
Switzerland
Rhine R.
Rhine-Rhone Canal
Belfort
Besancon
Dijon
Langres
Epinal
Colmar
Mulhouse
Belfort Gap
Vosges Mts.
Nancy
Metz
Thionville
Verdun
Sedan
Luxemburg
Treves
Moselle R.
Saarbrucken
Saar R.
Saar Basin
Metz
Nancy
Toul
Commercy
Bar-le-Duc
Rheims
Soissons
Compiegne
Amiens
Abbeville
Boulogne
Calais
Dunkirk
Lille
Roubaix
Tourcoing
Ghent
Bruges
Ostend
Antwerp
Brussels
Belgium
Liege
Namur
Charleroi
Mons
Valenciennes
Cambrai
Arras
Douai
Lens
Bethune
St. Quentin
La Fere
Laon
Reims
Chalons
Vitry
Epernay
Chateau-Thierry
Meaux
Paris
Versailles
Rambouillet
Evreux
Dreux
Chartres
Orleans
Montargis
Fontainebleau
Melun
Sens
Troyes
Nogent
Bar-sur-Aube
Langres
Chaumont
Vesoul
Belfort
Montbeliard
Besancon
Dijon
Beaune
Chalon
Macon
Lyons
Vienne
Grenoble
Valence
Avignon
Arles
Nimes
Montpellier
Beziers
Narbonne
Carcassonne
Toulouse
Montauban
Agen
Bordeaux
Perigueux
Angouleme
Cognac
La Rochelle
Rochefort
Saintes
Niort
Poitiers
Limoges
Tours
Blois
Orleans
Nantes
Angers
Saumur
Le Mans
Alencon
Falaise
Caen
Bayeux
Cherbourg
Le Havre
Rouen
Dieppe
Seine R.
Loire R.
Rhone R.
Saone R.
Garonne R.
Gironde R.

Munich, Hanover, Stuttgart, etc.); forestry schools (Forstakademien) at Eberswalde, Hohenheim, Münden, Tharand, etc.; mining schools (Bergakademien), Berlin, Freiberg, Klausthal; schools of commerce (Handelshochschulen), Aachen, Leipzig, Frankfort, Berlin, etc.; agricultural colleges (Landwirtschaftliche Hochschulen), Berlin, Göttingen, Halle, Jena, etc.; art schools (Kunst-Akademien), Berlin, München, Düsseldorf, Dresden, Weimar, and Karlsruhe; music schools (Konservatorien), Berlin, Leipzig, Dresden, Munich, Cologne, etc.; also numerous learned societies, such as academies (Akademien der Wissenschaften) of Berlin, Munich, etc. The largest libraries are at Berlin and Munich (over 1,000,000 vols., MMS., etc.); Hamburg, Heidelberg, Göttingen, etc., over 500,000.

Religion.—Protestants form 62 per cent. of entire pop. 1911, Catholics 36 per cent., Jews 1 per cent. Catholics are chiefly centered in Bavaria (70 per cent.); Baden (59 per cent.); in Prussia they form 36 per cent. (predominating in Rhenish Prussia, Silesia, Westphalia, and Hohenzollern); in Württemberg, 30 per cent; Hesse, 31 per cent; Oldenburg, 22 per cent. In Saxony and the remaining states Protestants constitute over 90 per cent. Liberty of conscience prevails.

Army and Navy.—Pre-war Germany was divided into ten fortress districts—Königsberg, Posen, Berlin, Mainz, Metz, Cologne, Kiel, Thorn, Strassburg, Munich—linked together by underground telegraphs and centers of strategic railways; military service was universal and compulsory between the ages of 20 and 45, though liability began at 17; seven years in active army, five years in first 'ban' or second-line army, six or seven years in second 'ban' without training, and remainder in Landsturm. During the World War Germany put over 10,000,000 men in the field; her strength dwindled after the great offensive in March, 1918. By Treaty of Versailles the Ger. army is reduced to 100,000 men. The navy has practically ceased to exist under the treaty, which allows only six battleships, six light cruisers, twelve destroyers, and twelve torpedo boats. Some seventy warships were surrendered at the armistice; the High Sea Fleet, interned at Scapa Flow, was scuttled by Ger. crews, June 21, 1919; many vessels are being refitted as merchant ships by Allies. By Treaty of Versailles no military or naval air force and no warlike flying machines are allowed to Germany.] See MAP GERMANY,

Colonies.—Previous foreign possessions of Germany, 1884-1918, were divided among the Allies. They were, in Africa: Ger. E. Africa, Ger. S. W. Africa, Kamerun, Togoland; in Pacific: New Guinea and Samoan Islands; and in Asia, Kiaochow. Area, *c.* 1,000,000 sq. m.; pop. *c.* 13,000,000.

History.—German history first comes to our knowledge through the conflicts of Rome with the tribes of Central Europe. We read in Tacitus that the Tungri were the first Ger. people to cross the Rhine. The Germans themselves do not appear to have given a general name to their nation, and the appellation *Teutones* was probably merely a tribal name. The Germans were a tall race, with fair hair, blue eyes, and light skin, and were remarkable for their muscular power. Each tribe was divided into four social grades—the nobles, the freemen, freedmen (or vassals), and serfs. The popular assembly elected the king, whose powers were strictly limited, and who in time of war was subservient to an elected leader. The Ger. tribe of the Teutones, in conjunction with the Cimbri, devastated Gaul towards the close of the 2nd cent. B. C., but was finally destroyed by Marius in 101 B. C. About the year 60 B. C. the Ger. chief Ariovistus devastated Gaul once more, but was defeated by Cæsar in 58 B. C.; Cæsar, however, failed to secure his position on the E. bank of the Rhine. Drusus made an expedition into Germania in 12 B. C., and confirmed the Roman position. His work of subjugation was continued by his brother Tiberius. In A. D. 9 the malversation in the prov. of the Roman governor Verus roused a rebellion of the Ger. tribes under Arminius. Arminius utterly defeated the Roman legions—a defeat partially redeemed by the successful campaigns of Germanicus, A. D. 15.

Decline of Roman Power.—But the Romans now ceased to attempt to push their authority beyond the Rhine. Steadily the strength of the Germanic tribes increased—a strength that was soon to overthrow the Roman Empire. The chief Germanic tribes of infant Europe were the Goths, the Franks, the Vandals, the Lombards, the Saxons, and the Scandinavians. In A. D. 410 Rome fell under the invading forces of Alaric the Goth. It was also sacked by Attila the Hun and Genseric the Vandal. But it was not till the time of Charlemagne that the tribes of Central Europe were effectually consolidated. Pepin was the first of the Carolingian kings, and his policy was to push his frontiers over Europe and champion the Pope. In 768 he died, leaving his kingdom to Carloman and Charles — afterwards known as Charlemagne. Charlemagne also built up his empire by inspiring

his subjects with patriotism and religion. He pushed his armies into Spain and Italy, and mastered the Saxon resistance.

The Holy Roman Empire.—In 800 Pope Leo III. crowned him Emperor of the Romans. Charlemagne died in 814, and was succeeded by Louis, his son. The great empire now began to totter. By the treaty of Verdun in 843 France and Germany became separate kingdoms, ruled respectively by Charles and Louis, the sons of Louis le Debonnaire, the Rhine forming the rough line of division between the two political entities. The Norsemen swooped down upon the newly formed kingdom, and neither Louis nor his son Charles was strong enough to resist them effectually. For sixty-eight years after the Treaty of Verdun the Carolingians continued to rule the territory E. of the Rhine, but they proved degenerate and effete. In 911 Conrad, Duke of Franconia, was elected ruler of the Germans, and in 918 Henry the Fowler. Henry was a capable and powerful ruler. His policy was to unite all the German-speaking tribes. He conquered the dukes of Alemannia and Bavaria, and mastered Lorraine. But his most redoubtable foes were the Hungarians. In order to fortify his E. frontiers against them he planted *burgs* along his marches—the germs of the famous Ger. cities—and, to cope with the Magyars, whose strength lay in horsemanship, he founded a strong cavalry of nobles. Hence he is called 'the founder of knighthood.' In 936 Henry was succeeded by his son Otto. The grand-dukes rose in insurrection, but Otto quelled them, and similar disturbances were obviated by a powerful organization of margraves.

But his great object was to regain the imperial crown, and so he turned his attention to Italy. His opportunity came when Adelaide, widow of Lothaire, King of Italy, implored his aid. He speedily subdued Lombardy and married Adelaide. In 961 he was crowned King of Lombardy, and in 962 Pope John XII. granted him the imperial crown of the Western Empire—a distinction previously conferred upon Charlemagne. Otto improved the whole constitution of Italy, and his domestic policy was equally salutary. Otto was thus one of the great builders of the Ger. Empire, and he made it the foremost power in Europe. By making himself champion of the Holy Roman Empire he resuscitated its supremacy in Europe. But his great imperial policy did not continue in the reigns of his later successors.

Empire and Papacy.—Germany's hold in Italy was doomed to bring her into conflict with the spiritual powers. The traditional elective system of Ger. monarchy, too, fostered an independent spirit among the nobles, and favored the subsequent disintegration of the empire into states—(*i.e.*), of the Saxons, Thuringians, Franconians, Suabians, and Bavarians. Otto II., 973-83, felt his position almost untenable. Otto III., 983-1002, came into conflict with the princes and the Church. Henry II., 1002-24, loosened his hold on Italy and concentrated his attention on his domestic affairs. Conrad II., 1024-39, was more successful than his immediate predecessors, and to a considerable extent consolidated anew the reaches of the empire. He successfully balanced the interest of his dominions in Germany and in Italy. He acquired the kingdom of Arles in 1032. His son, Henry III., 1039-56, succeeded him, and gained Bohemia, Hungary, and Poland as federal states. Under Henry, Germany's imperial power was at the zenith.

He was succeeded by Henry IV., who came into direct collision with the Pope on the subject of investiture. The event of the First Crusade towards the end of his reign aggravated the rupture. From the marshalling of the Christian army Henry held aloof, refusing to arm at the call of his acknowledged enemy. Henry V., 1106-25, ameliorated matters by his concessions at the Concordat of Worms, 1122; but the imperial power of Germany was losing prestige, while the spiritual supremacy of Rome was becoming more widely acknowledged. Lothair II., 1125-37, did not find the difficulties of his position so insurmountable, and lived on amicable terms with Innocent II. His successor, Conrad III., felt the stress of his situation bitterly. St. Bernard enlisted his services for the Second Crusade. Conrad's dominion in Italy was fatally weakened by the rapid growth of autonomous cities. Conrad was succeeded by Frederick Barbarossa, 1152-90, who endeavored to shatter the autonomy of the Lombard cities, but his schemes proved abortive.

The feud in Italy between the Ghibellines (or upholders of the emperors) and the Guelphs (or upholders of Ital. freedom) became intense. Milan led the opposition to the Ger. supremacy, but fell in 1162. Frederick then attempted to bolster up his position by stationing podestas, or governors, in the cities, but this only incited revolt. In 1167 the League of Lombardy was formed in order to assert the freedom of the federal cities. Frederick then tried to form a counter-league of Ghibelline cities. Protracted warfare ensued, until a decisive battle was fought at Legnano, near Milan. Frederick barely escaped from the scene of defeat. In 1183

Frederick, by the Peace of Constance, agreed that the young Ital. republics should govern themselves, and levy their own defensive forces. The Peace of Constance brought the real dominion of Germany over Italy to an end, and reduced her transalpine claims to a purely nominal footing. Frederick had some measure of success against the encroachments in Bavaria and Saxony of Prince Henry the Lion. But when the tidings came of the capture of Jerusalem by Saladin, and Richard I. of England and Philip Augustus of France were mustering their forces for the Third Crusade, Frederick promptly advanced from Ratisbon, following the route via Adrianople to the Hellespont, and marched victoriously through Asia Minor. He conquered Iconium, but was drowned in the river Selef, in Cilicia.

Henry VI., 1190-7, a man of unbounded ambitions, succeeded Frederick. He aimed at the conquest of the Byzantine Empire, and sought to realize his projects by planting his foot in Sicily and working under cover of a Fourth Crusade. He married Constance the heiress of Sicily, with a view to securing his position. He then dispatched his remaining forces to the Holy Land. Hopes were entertained of taking Jerusalem, but the early death of Henry brought the Fourth Crusade to an end. At Henry's death a rivalry arose between Otto, son of Prince Henry the Lion, and Frederick, son of Henry VI. Otto was crowned as Otto IV. in 1209, but was excommunicated by Innocent III., and Frederick II. was crowned in 1212. Otto was defeated at Bouvines in 1214 by Philip Augustus, and Frederick now had no rival to his title. Frederick was a man of high intellectual standing, but he lacked that keen and practical insight that was necessary in order to maintain a balance of the Ger. powers, and he is to a large extent responsible for the disintegration of the early Ger. Empire. In order to devote his full attention to the opposition of the Papacy, he left the government of domestic affairs in the hands of the princes, and thus abolished the successful policy of the Hohenstaufen kings, who had striven to check the independence of the nobles. The towns, too, began to assert their autonomy—a fatal sign of disintegration. In the S., Ulm, Nuremberg, Augsberg, and Ratisbon were developing to an alarming degree. In the N., the Baltic towns were soon by the Hanseatic League to defy the central power.

His son, Conrad IV., 1250-4, was the last of the Hohenstaufens. From his death, in 1254, to the election of Rudolf, in 1273, was the period of the *Great Interregnum*. When Rudolf of Habsburg came to the throne the domestic situation had undergone a fundamental change—a change brought to pass by the two fatal forces of disintegration, viz., the opposition of the Papacy and the opposition of the nobles. Powerful principalities weakened the central power. The power of the archbishops also, whose chief sees were in Mainz, Cologne, and Trier, began to be asserted. Rudolf of Habsburg was succeeded by Adolf of Nassau, 1292-8, who was deposed and slain by the princes, thus proving that the combination of an elective monarchy and a system of powerful principalities were self-destructive. The fate of Adolf's successors confirms the truth of this statement. The reigns of Albert of Austria, 1298-1308, the son of Rudolf, and Henry of Luxemburg, 1308-13 were syncopated by a similar opposition. Ludwig IV. of Bavaria successfully combated the claims of Frederick, son of Albert, at Mühldorf in 1322, and occupied the throne till 1346. During his reign a decisive step was taken against papal interference. In 1338 the convention of the electors at Rhense declared the Ger. sovereign independent of the Pope. Ludwig was succeeded by Charles IV., 1346-78, son of John of Bohemia. The most important event of this reign was the issue of the Golden Bull, 1356. By this edict the system of imperial election was defined. Seven electors were recognized—viz., the King of Bohemia, the Count Palatine of the Rhine, the Duke of Saxony, the Margrave of Bradenburg, and the archbishops of Mainz, Cologne, and Trier. The emperor was to be elected at Frankfort-on-Main and crowned at Aix-la-Chapelle. The new system continued to operate for four and a half centuries. Wenceslaus, the son and successor of Charles, was deposed in 1400. He was succeeded by Rupert, who ruled till 1410. Albert II. of Austria succeeded Rupert, and was himself succeeded by Frederick III., Duke of Styria, 1440-93. Frederick was succeeded by his son, Maximilian I., 1493-1519, who, by his marriage with Mary of Burgundy, acquired new territory.

The Reformation.—Maximilian soon recognized that the three chambers which composed the Diet were inadequately organized, but he failed to carry out his scheme of reform. In 1512 the empire was divided into ten departments for administrative purposes. Charles of Spain was elected emperor as Charles V., 1519-56, and widely extended the imperial supremacy, but his policy was frustrated by the great Reformation movement. Charles was

the grandson of Maximilian. He succeeded Ferdinand as King of Spain in 1516. On the death of Maximilian he had a rival in his claims to the throne in Francis I. of France. The inroads of the Turks prompted the electors to choose Charles, whose dominions now extended over Austria, the Netherlands, Naples, Spain, and large tracts in America. The great struggle of the reign of Charles V. was against Francis of France. Italy was the theater of the war. In 1525 the decisive battle of Pavia was fought, in which Francis was worsted and taken prisoner. After a year's imprisonment Francis was released, after signing a treaty by which he renounced his claims in Italy and ceded the duchy of Burgundy to Charles. Hostilities broke out afresh. Francis formed a league with the Pope, but the army of Charles marched against Rome, sacked it, and took the Pope prisoner, 1527. A new treaty was made, 1529, by which Francis agreed to pay a heavy indemnity, ceded Flanders and Artois, and renounced his claims in Italy. Charles agreed to waive his claims on Burgundy.

The Reformation in Germany was now at a white heat. At the Diet of Worms in 1521 Charles had pronounced Luther a heretic. In 1530, at the Diet of Augsburg, was read the Confession of the Prot. Faith. The Confession was condemned by the Diet, but the Protestants only gathered strength. The emperor was desirous of mustering all his forces against the inroads of the Turks, and could not afford to estrange so vast a portion of his people. He therefore annulled his decrees at the previous Diets, and Protestantism won the day. The great ambition of Charles was to turn the tide of Moslem supremacy which threatened Europe on the E., but his protracted wars with Francis spent his strength and rendered his attack on Algiers disastrous. In 1545 Protestantism met a redoubtable foe in the Jesuits, and was denounced by the Council of Trent. In 1546 Francis and Luther both died, and Charles resolved to trample out the hold of the reformed faith; but a temporary victory was followed in 1552 by the Peace of Religion—a treaty by which he secured the claims of the Protestants. Charles V. was succeeded by his brother Ferdinand, during whose reign the rupture between the Protestants and Romanists was keenly felt. The conflict grew keener in the reigns of the succeeding monarchs —Maximilian II. and Rudolph II.

In the reign of Matthias the crisis came, and the Thirty Years' War commenced. The war originated in a contest for the throne of Bohemia between the Protestant Frederick and the Catholic Ferdinand. The Protestants were at first worsted, and Christian IV. of Denmark, who championed the cause of Frederick, was no match for the military genius of the Bohemian general Wallenstein, who assisted Ferdinand. Richelieu's influence secured the recall of Wallenstein. But the advent of Gustavus Adolphus of Sweden, the great Prot. champion, turned the tide of battle. The battle of Leipzig in 1631 was a decisive victory for Protestantism. Ferdinand in desperation recalled Wallenstein. In 1632 the forces of Wallenstein and Gustavus Adolphus met at Lützen. The battle ended with the victory of the Protestants, but a heavy price was paid by the death of the noble King of Sweden. The war ended with the Peace of Westphalia in 1648, by which France retained Metz, Toul, Verdun, and Alsace (except Strasbourg), with the fortress of Breisach and Philippsburg; Holland was made a free state; the Swiss Cantons were made free; Sweden was awarded a large indemnity, and received important ports on the Baltic. Germany thus lost the absolute navigation of the Rhine, the greater part of her empire, and was confronted with the independence of the principalities. During the reign of Leopold, 1658-1705, Germany recovered to some extent from her abject state. Louis XIV. of France aimed at the supremacy of Europe, and this drew Germany closer to England, and forced the Ger. princes to stand by the central power. In 1714 the Peace of Baden settled the relations between Germany and France.

Rise of Prussia.—In the first year of the 18th cent. a momentous change was made among European powers by the creation of the Prussian kingdom, with Frederick the Great on the throne. The first decisive action of the new monarch was to seize from Maria Theresa the realm of Silesia. Peace was secured by the Treaty of Dresden, by which Frederick acknowledged the election of Francis I., husband of Maria Theresa, to the imperial throne. During the eight subsequent years of peace, Frederick reconstructed the constitution of Prussia. Then followed the Seven Years' War, involving untold bloodshed, and ending with the Peace of Hubertsburg. By this peace Frederick retained Silesia, the bone of contention. In 1772 Frederick seized on Polish Prussia. But the conquest of Napoleon made a temporary upheaval of the European countries. The fall of Napoleon again altered the face of things; the ferment was followed by clarification. One great lesson the Germanic states learned from

the disasters of the French Revolution and the rise of Napoleon was the expediency of union. A step was taken in 1834 by the formation of a Customs Union (*Zollverein*), headed by Prussia. But it was left to Bismarck to decide between Austria and Prussia as the leading state of Germany. The war of spoliation against Denmark fanned the fire of jealousy between Austria and Prussia. The war of 1866 culminated in the defeat of Austria at Sandowa; Austria was humiliated, and Prussia became the dominant power.

Bismarck formed the N. Ger. Confederation, of which he became chancellor. In 1870 the Franco-Ger. War broke out; on surrender of Paris Bismarck decided the conditions of peace. During the war the states of S. Germany had united with Prussia and the N. Ger. Federation. This Confederation was changed into the Ger. Confederation, and in 1871 William, King of Prussia, was crowned as German emperor at Versailles. Bismarck took the title of prince, and now became chancellor of the Ger. Empire. Bismarck's policy was anti-democratic. He aimed at checking the power of France, pacifying Russia, and confirming an alliance between Germany, Austria, and Italy. His Falk laws were directed mercilessly against the Roman Catholics. His ideas as to colonial expansion were never realized. Nevertheless, he was the founder of one of the greatest empires of the world.

On the accession of William II., in 1888, the authority of Bismarck waned. He was requested to resign his chancellorship, and an open feud arose between the young monarch and the old chancellor. The ill-feeling, however, abated during the last few years of Bismarck's life. William II. was a staunch believer in the divine right of kings, and his autocratic views brought him into collision on several occasions with his councils. On the subject of the Brit. occupation of S. Africa the Kaiser was very bitter, and his somewhat rash speeches were the cause of deep-seated ill-feeling between the two countries. Russia was for long a thorn in the flesh of the Ger. Empire, but fear of an invasion abated until the beginning of 1913, owing to the disastrous effects on Russia of the Russo-Japanese War. During the reign of William the progress of the empire was little short of miraculous. The commerce of the country made vast strides, and the military organization was put on a new basis. But perhaps the Kaiser's greatest work was the creation of a great navy, second only to that of Britain. But the stress of the upkeep of these great military forces and the rigorous protectionist system aggravated social discontent in Germany, and the growth of the Social-Democratic party was a serious menace to the entire prevailing policy.

Following a visit of the Kaiser to Tangier, 1905, a Franco-Ger. conference at Algeciras settled France's predominance along the Algerian border and N. Morocco coast. A Ger. cruiser was sent to Agadir (S. Morocco) in 1911 to assert Ger. demands for concessions (see AGADIR). A settlement was reached by treaties with France, Nov., 1911, by which a Fr. protectorate was countenanced in Morocco, and Fr. territory on the Congo was ceded to Germany.

The Kaiser William II., though he posed as the apostle of European peace, always insisted on the 'mailed fist' and the 'shining armor;' and the increase and efficiency of his army, the building up of a strong navy, and an attempt to win the sovereignty of the air were the main obsessions of his life. Thanks to him, and to the professors whom he enlisted in his cause, war became the religion of Germany. Over seven hundred books dealing with warfare were published annually in the Fatherland in the years preceding the World War.

In 1913, when the three years service Act was passed in France, Germany increased her military establishment greatly; the widening of the Kiel Canal was completed in July, 1914. Thus Germany was ready for war when the Balkan troubles afforded her an excuse for drawing the sword. For an account of the long struggle, see WORLD WAR.

Ludendorff, in his *My War Memories* (vol. ii.), tells us that Germany's 'black day' was Aug. 8, 1918, after which exhaustion and breakdown of *morale* became daily more marked. Retiring troops meeting others going into action greeted them with such cries as 'Blackleg!' and 'You're prolonging the war!' A spirit of insubordination in the army reflected the conditions at home, where the people were on the verge of revolution. On Sept. 28, G. H. Q. recommended an armistice. Prince Max of Baden was appointed imperial chancellor, Oct. 4, and a note was dispatched to President Wilson, Oct. 5, offering to accept his 'fourteen points' as a basis of negotiations. In reply, the president demanded as a condition precedent to the conclusion of any armistice the evacuation of the occupied territory in the West. On Oct. 12 a second note was sent to America agreeing to the proposed evacuation. In his answer to this second note the president demanded the suspension of the submarine war campaign, and stigmatized the Ger. conduct

of the war in the West as a violation of international law. Germany agreed, Oct. 20, to abandon the submarine campaign, and on the 23rd the president made it clear that the armistice conditions must be such as to make it impossible for Germany to resume hostilities, and to give the Allies unlimited power to settle for themselves the details of the peace. Finally, in a note on Oct. 27, Germany agreed to this proposal, and an armistice was concluded on Nov. 11, 1918.

Meanwhile revolution, beginning in the navy, had broken out in Germany; soldiers' and workmen's councils had been set up, and civil war had begun. At noon on Nov. 9 Prince Max, on his own initiative, pronounced the abdication of the emperor, who fled to Holland, followed shortly afterwards by the crown prince. The princes of the various states also abdicated; republics were set up everywhere, and Germany entered upon a period of chaos. The Red Flag was flown in Berlin next day amidst cries of 'Long live the Republic!' The city was in the hands of the Spartacist group, and an Ebert-Haase government was set up in the midst of a 'witch's cauldron' of confusion and civil strife. The Kaiser signed his abdication on Nov. 28. By Dec. 6, in accordance with the terms of the Armistice, Allied troops had begun to occupy the specified area W. of the Rhine, together with the bridgeheads of Cologne, Coblenz, and Mainz. A new armistice was signed on Jan. 17, 1919, and shortly afterwards voting began for the National Assembly, which was opened early in Feb. at Weimar, with a Socialist majority and a Coalition Socialist cabinet. Ebert was elected president and Scheidemann chancellor. A provisional constitution was settled on Jan. 29. Thereafter, for several months, tumult, rioting, open war, and strikes continued. In Bavaria the Reds gained the upper hand, Eisner, the president, and Auer, leader of the Majority Socialists, being shot. Martial law was declared, and Noske, the minister of defense, showed some firmness. Early in May the Reds in Bavaria were overthrown by government troops, and the Hoffman government became supreme. In the same month Hindenburg resigned his office as head of the army. General strikes in Berlin and Hamburg and fighting in Weimar signalized the month of June. On the 21st the central government decided to sign the Peace Treaty (see PEACE CONFERENCES). Two days later a new ministry was formed, with Bauer as prime minister. On June 28 the Peace Treaty was signed; it was ratified on July 10, and before the end of the month Bauer resigned. On July 31 the new constitution was adopted. Risings in Upper Silesia were put down with great barbarity in August, and in September the Allies demanded that the Ger. troops in the Baltic provinces under von der Goltz should be withdrawn. At first the Germans adopted a defiant attitude, but eventually gave way, and in Nov. an inter-allied Baltic Commission took over control of the frontier. Haase, who had been shot in October, died of his wounds early in November. Monarchist demonstrations in Berlin, when Hindenburg appeared to give evidence at the inquiry into responsibility for the war, and pro-militarist speeches by Ludendorff at Potsdam in December, presaged a *coup d'etat*, which took place in March, 1920, and was momentarily successful, Ebert fleeing from Berlin to Stuttgart, and the pan-German Dr. Kapp becoming imperial chancellor. The new régime, however, was very short-lived. A general strike took place, and by March 17 Kapp had fled to Sweden and the Ebert government had returned to Berlin. Chaos again supervened; Spartacist successes were numerous, and the government asked permission to send Reichswehr into the neutral zone in the Ruhr district to suppress the Communists. The French, who had all along been alarmed at the size of Germany's armed forces (estimated in Dec., 1919, at 1,200,000), refused, and when the Reichswehr appeared in the Ruhr district, occupied Frankfort, Hanau, and Darmstadt, April 6, 1920. Ger. compliance with the Fr. demands led to a withdrawal of the Fr. troops, May 17. A general election in June gave the Socialist Coalition a small but not a working majority. On June 5, 1920, Herr Fehrenbach succeeded Müller as chancellor. For subsequent Allied conferences in reference to disarmament, etc., in accordance with the Treaty of Peace, see PEACE CONFERENCES.

The years immediately following 1920 were marked in Germany by efforts to reorganize the economic structure of the country. The government on the whole functioned without serious disorders. The chief financial and economic problem was that of reparations. See REPARATIONS. This and other causes resulted in an inflation of the mark to a point where it became practically worthless. Walter Rathenau, one of the most foremost statesmen, was assassinated on January 24, 1922. On November 21, 1922, Wilhelm Cuno became chancellor. Diplomatic relations were resumed with the United States with the appointment of Alanson B. Houghton as American Ambassador, in April, 1922. The decision of the League of Nations in relation

to Upper Silesia was agreed to by the German Reichstag, but with expressions of strong disappointment with the result, which was regarded as a German defeat. Although no definite efforts were made to restore the monarchy, it was evident that there was a strong undercurrent, especially in Bavaria, to bring again into power the Hohenzollern family. During this period the government was really in the hands of great financiers, the most prominent of whom was Hugo Stinnes. The continued failure of the government to pay reparations resulted in January, 1923, in the decision of France to take forceful possession of the Ruhr region, the great iron and coal producing area. This was done in the face of strong opposition from England and from the other allied and associated countries, except Belgium. In February, 1923, French troops advanced into the Ruhr and took possession of a number of the most important cities, including Essen. See RUHR. In the month of November a monarchist rebellion headed by Adolf Hitler and Gen. Ludendorff broke out in Munich, but was promptly quelled by the authorities.

GERMINATION is the process whereby a plant emerges from the seed when the latter is placed under suitable conditions. The term may also be applied to any cell which divides into a number of cells to produce a mass of tissue—(*e.g.*) the germination of a pollen grain on the stigma; the germination of a fern spore to produce the prothallus.

GERMISTON, town adjoining Johannesburg; railway junction. Pop. 42,218, of whom 16,196 are whites.

GERM THEORY OF DISEASE. See DISEASE, GERM THEORY OF.

GEROLSTEIN (50° 14′ N., 6° 39′ E.), watering-place, Rhine province, Germany; mineral baths.

GÉRÔME, JEAN LÉON (1824-1904), a French painter; *b.* at Vesoul. In 1841 he became a pupil of Paul Delaroche and a student at the Ecole des Beaux Arts, Paris. During 1844-45 he visited Italy with Delaroche, and in 1847 his *Cock-fighting* was exhibited. In 1855 *Le Siecle d'Auguste et la naissance de Jesus-Christ,* representing allegorically the decline of paganism and the birth of Christianity, placed him among the leading French painters. The state purchased it, and bestowed upon G. the Cross of the Legion of Honor. The *Duel* of 1857 increased his reputation, and the *Gladiators,* 1859, was looked upon as his masterpiece. Travels in Turkey and Egypt led to the production of Eastern pictures, which many consider his best work. Among these are *Turkish Prisoner*; *Prayer*; and *Slave Market.* He excelled also in historical subjects, *Louis XIV.* and *Moliere* and *The Death of Marshal Ney* are famous examples in this class. G. was a fine colorist and painter of the human figure; some of his pictures are marked by minuteness of finish.

GERONA. (1) (42° N., 2° 35′ E.), maritime province, N.E. Spain, forming part of Catalonia; generally mountainous; rich in minerals and timber; numerous mineral springs; extensive fisheries; textile industries. Area, 2264 sq. miles. Pop. 1920, 332,074. (2) (42° N., 2° 50′ E.), capital, prov. Gerona, Spain; remains of ancient walls and ruined fortifications; bp.'s see; XV.-cent. Gothic cathedral; paper and textile manufactures; besieged by Fr. 1809. Pop. 16,000.

GERONIMO, a famous Indian chief of the Apache tribe. He headed many outbreaks in Arizona and other parts of the Southwest, and was one of the most agressive and cruel of the Indian leaders in that region. In 1886 he surrendered to General Crook, but while negotiations for an agreement were under way, he escaped to the mountains where he remained until compelled to surrender by General Miles. He was imprisoned at Fort Sill, Oklahoma, until his death, in 1907.

GERONTIUS, COUNT (360-413), Byzantine general; dethroned Constantine III., and besieged Byzantium; his troops mutinied; committed suicide.

GEROULD, KATHARINE (1879), an American novelist; *b.* in Brockton, Mass. After graduating from Radcliffe College, in 1900, she became a reader in English at Bryn Mawr College, but resigned in 1910 to devote herself entirely to her writing. She is rated as one of the most serious fiction writers in this country, most of her novels being descriptive of life in New England. Among her books are *Vain Oblations* (short stories), 1914; *The Great Tradition,* 1915; *A Change of Air,* 1917; and *Lost Valley,* 1922.

GEROULD, JAMES THAYER (1872) librarian; *b.* in New Hampshire. In 1895 Bachelor of Arts of Dartmouth College. From 1896-1897 assistant librarian of General Theological Seminary. At Columbia University Library chief of department from 1897-1900. From 1900-1906 librarian at University of Missouri. 1906-1920 librarian at

University of Minnesota. Since 1920 librarian at Princeton University. Literary editor of The Bellman from 1916-1918. Fellow of American Library Institution. Member of American Library Association.

GERRESHEIM (51° 16′ N., 6° 59′ E.), town, Rhineland, Prussia; incorporated with Düsseldorf; glass and wire manufactures. Pop. 15,000.

GERRY, ELBRIDGE (1744-1814), Amer. politician; *b.* Marblehead, Massachusetts; grad. Harvard (1762); member of Massachusetts gen. court (1772-1773); of Continental Congress (1776-81, 1783-85); hostile to Britain; anti-Federalist in national House of Representatives (1789-93); Gov. of Massachusetts (1810-12); Vice-Pres., U.S.A. (1812).

GERRY, ELBRIDGE THOMAS (1837), an American social reformer; *b.* in New York. He graduated from Columbia University, in 1857 and began to practice law in New York three years later. He was chairman of the New York State Commission on Capital Punishment (1886-8), which was instrumental in having the electric chair substituted for hanging, New York being the first state to make this change. He is most prominently known, however, as the head of the New York Society for the Prevention of Cruelty to Children, commonly named from him, and of which he was president from 1876 until 1901.

GERRY, PETER GOELET (1879), senator; *b.* in New York. In 1901 Bachelor of Science Harvard University. In 1906 admitted to Rhode Island Bar. In 1912 member of Representative Council of Newport, Rhode Island. Was delegate in 1912 and 1916 to Democratic National Convention from Rhode Island. Member of Congress from 1913-1915, second Rhode Island district. United States Senator for term of 1917-1923. Vice President of American Humane Society.

GERRYMANDER, a device to gain political advantage by arranging electoral districts; word coined during Gerry's administration of Massachusetts.

GERS (43° 40′ N., 0° 30′ E.), department, S.W. France; formed part of ancient Gascony; surface hilly, partly covered wood and heath; soil moderately fertile; chief rivers, Gers, Save, Balse, and Ardour; many sheep and poultry reared; extensive vineyards; brandy. Area, 2428 sq. miles. Pop. 1921, 194,406.

GERSON, JOHN (1363-1429), Fr. cleric and scholar; proper name, Jean Charlier de G.; *b.* G., France; chancellor of Paris Univ., 1395; endeavored to reform Church, and to replace scholastic theology by simpler mode of thought; influential in ending papal schism, writing many pamphlets for guidance of Council of Pisa; on failure of which to restore unity, he used his influence in formation of Council of Constance, 1414; having incurred enmity of Duke of Burgundy, he spent several years in exile in Tyrol, where he wrote *De Consolatione Theologiae.*

GERSOPPA, FALLS OF (14° 12′ N., 74° 40′ E.), a cataract on Sharavati River, N. Kanara district, Bombay, India.

GERSTACKER, FRIEDRICH (1816-72), a German novelist and writer of travels, *b.* at Hamburg. In 1837 he went to America, wandering on foot through the United States. He returned to Germany in 1843, and became famous by the publication of his *Diary.* He published his first novel, *Die Regulataren in Arkansas* in 1845. From 1849-52 he traveled round the world, visiting N. and S. America and Australia. In 1812 he went to Egypt and Abyssinia, and in 1867 visited N. America, Venezuela, and the W. Indies. On his return he wrote novels descriptive of the places he had visited. Some of his best works are: *Flusspiraten des Mississippi*, 1848; *Tahiti*, 1854; *Die beiden Straflinge*, 1857; *Blau Wassar*, 1858.

GERSTENBERG, HEINRICH WILHELM VON (1737-1823), Ger. poet; wrote *Ugolino*, and was a pioneer of the *Sturm und Drang* school.

GERVASE OF CANTERBURY (c. 1140-1210), Eng. Benedictine monk; wrote two Eng. chronicles, one of which, the *Gesta Regum*, included his own period; also wrote a topographical description of England (*Mappa Mundi*).

GERVASE OF TILBURY (fl. 1220), Eng. hist. writer; author of *Otia Imperialia* (history and legend) and *Liber Facetiarum* (anecdotes).

GERVINUS, GEORG GOTTFRIED (1805-71), Ger. historian and critic; *b.* Darmstadt; became Privatdozent at Heidelberg (1830), then prof. of History and Lit. at Göttingen; honorary prof. at Heidelberg (1844); pub. *Geschichte der poetischen Nationalliteratur der Deutschen*, 1835-42; and a study of Shakespeare.

GERYON (classical myth.), a triple-

bodied giant, *s.* of Chrysaor. He possessed a splendid herd of red cattle, which it was the tenth labor of Heracles to carry off. This he did, and the monster perished at his hands.

GESNER, KONRAD VON (1516-65), a Swiss writer and naturalist, *b.* at Zürich. He studied at Strassburg, Bourges, and Paris, and was appointed professor of Greek at Lausanne in 1537. In 1541 he became a professor of natural history at Zürich. G.'s favorite study was probably botany, and he published in 1542 a *Catalogue of Plants* in four languages: Latin, Greek, German, and French. He enriched his botanical knowledge by frequent journeys, and founded a small botanical garden at Zürich. Another important work of his is *Bibliotheca Universalis*. In 1551-58 appeared his great zoological work *Historia animalium*.

GESSLER. See TELL, WILLIAM.

GESTA ROMANORUM ('Deeds of the Romans'), collection of stories in Lat., from various sources, probably compiled about the early part of the XIV. cent., and drawn upon by Chaucer and later poets.

GESTATION. See OBSTETRICS.

GETA, PUBLIUS SEPTIMIUS (189-212 A.D.), Rom. emperor; 2nd *s.* of Septimius Severus; became joint ruler with his elder *bro.*, Caracalla, by whom he was murdered.

GETÆ (called by Romans *Daci*), ancient Thracian tribe, noted for valor and culture; conquered by Trajan (106 A.D.).

GETHSEMANE, garden on the Mount of Olives, near Jerusalem, where Jesus spent the night previous to His crucifixion.

GETTYSBURG, BATTLE OF, one of the most important battles of the Civil War. Fought July 1, 2, 3 in 1863 at Gettysburg, Pa., between the Federal Army of the Potomac, under Gen. Meade and the Confederate Army of Northern Virginia under Gen. Robert E. Lee. After the defeat of the Federals at Chancellorsville the two armies were on opposite sides of the Rappahannock River. Lee had formed three corps under Generals Hill, Longstreet and Ewell, to invade the north a second time, hoping to force Grant to raise the siege of Vicksburg to protect Washington and the northern cities. On June 5 with 75,000 men he crossed the Potomac and entered Pennsylvania. The rest of his army had joined him by June 25. On June 13 General Hooker started after him with 85,000 men but owing to trouble with General Halleck at Washington was relieved of command by General George Meade. On July 1, Hill's cavalry came in contact with Buford west of Gettysburg and being reinforced, the battle began. Gettysburg is 7 miles from the Maryland border. To the west is Seminary Ridge extending north and south. To the east is Missionary Ridge and then Cemetery Ridge ending with Cemetery, and Culp's Hills. To the south is Little Round Top and Round Top, and in the center lies the town. The Army of the Potomac comprised 7 corps. 1. Reynolds, later Doubleday. 2. Hancock, later Gibbon. 3. Sickles. 5. Meade. 6. Sedgwick. 11. Howard. 12. Slocum. An Army of 82,000 infantry and artillery and Pleasanton's 12,000 cavalry. Guns 410. On McPherson's Ridge sloping west from Seminary Ridge, Buford and Heth were in contact. Reynolds' 1st corps held its own against superior numbers for two hours when Reynolds was killed. All day west and north the battle raged, the Federals losing. Their strong point along Cemetery Hill was in peril. Meade and Lee now brought up their main bodies. The Federal position on the second day was in the form of a hook, Culp's Hill the barb, and extending over Round Top and Little Round Top and some peaks to the far left. The 3rd corps under Sickles was a little ahead of the Federal line along the Emmitsburg Road, the center at Peach Orchard, left to the 'Devil's Den', Lee held most of Seminary Ridge. Longstreet the right, Hill center and Ewell the left, stretching to a point opposite Culp's Hill. At 4 a.m. on July 2 Longstreet attacked Sickles left, but the Federal lines were not broken. Ewell struck at the Federal right and fighting into the night got within Federal lines but was driven out in the morning. On the third day after artillery preparation Lee attacked the Federal center. Pickett led with 5000 men. Wilcox with 5000 on the right and Pettigrew with the same number on the left. The Federal artillery flung back the forces of Wilcox and Pettigrew, but Pickett dashed forward and broke the Federal line to be finally thrown back in disorder having lost heavily, Stuart's cavalry failed in their attack on the Federals right and the battle was lost to the Confederates. The Federals lost in the battle 3,072 killed, 14,497 wounded and 5,434 captured or missing. The Confederates had 2,592 killed, 12,709 wounded and 5,150 captured or missing. November 19, 1863 the battlefield was consecrated as a National Soldiers Cemetery.

GEVELSBERG (51° 18′ N., 7° 23 E.), town, Rhine province, Prussia; cutlery. Pop. 18,000.

GEYSER, GEISER, GEISIR, natural fountain of boiling water found especially in Iceland, but also N. America, New Zealand, Tibet, and the Azores; in Iceland they number *c.* 100, and are all in a plain some 30 miles. N.W. of Mount Hecla. In the Yellowstone regions of Wyoming the jets rise to a height of 90-250 ft., while in Auckland (N.Z.) three kinds are known—the intermittent, steam, and hot-water cisterns. G's occur only in region where recent volcanic activity has been in evidence, and are caused by the filtration of water on to some heated center, probably a lava bed.

GEZER (*c.* 31° 55′ N., 35° 5′ E.), ancient Canaanite city, modern Tel Jezar, on S.W. border Ephraim; important stronghold. Excavations have been carried on and have revealed the existence of many cities here since the early dawn of civilization.

GHADAMES, GADAMES, or **RHADAMES,** ancient *Cydamus* (30° 5′ N., 9° 14′ E.), town and oasis, trading center, in Sahara, N. Africa; formerly important; many ancient ruins; inhabitants chiefly Berbers and Arabs; dependency of Tripoli. Pop. *c.* 7000.

GHARA, the name given to the R. Sutlej, in British India, from the point where it joins the Bease to its junction with the R. Chenab.

GHAT, RHAT (25° N., 10° 15′ E.), town and oasis, Sahara, Tripoli; trading center. Pop. 4000.

GHATS, EASTERN G. (18° N., 82° 40′ E.), Western G. (16° N., 74° E.), two mountain ranges bordering E. and W. shores of India, uniting near Cape Comorin; E. G. extend N. to Balasore; average elevation, 1500 ft.; W. G., N. to valley of Tapti; average elevation, 3000 ft.; highest summit of the Nilgiris (W. G.) is Dodabetta, 8700 ft.

GHAZI, Mohammedan title given to zealots who have taken prominent part in the destruction of unbelievers.

GHAZIABAD (28° 40′ N., 77° 28′ E.), town, Meerut, United Provinces, Brit. India; railway junction. Pop. 11,000.

GHAZIPUR (25° 35′ N., 83° 38′ E.), town and district, Benares, United Provinces, India; scent distilleries; opium Pop. 40,000.

GHAZNI (33° 34′ N., 68° 17′ E.), famous city in Afghanistan, situated on high tableland on direct road between Kabul and Kandahar; town consists of dirty streets surrounded by fortified walls. Ancient city of G. probably occupied site some distance away, where there is large extent covered with ruins; only preserved remains, two towers, erected by Conqueror Mahmud and his son; under Ghaznevid dynasty G. became city of great wealth and importance, and capital of empire. At village of Ranzah, in vicinity, is Mahmud's tomb; many holy shrines around city where pilgrims come yearly. In 1839 G. was captured by British; taken by Afghans, 1842, but forced to surrender to Nott same year.

GHEE, highly refined butter, largely used by natives in India.

GHEEL, GEEL (51° 9′ N., 4° 59′ E.), town, Antwerp, Belgium; colony for the insane. Pop. 14,000.

GHENT (Fr. *Gand*), city, Episc. see, and chief tn., prov. Flanders, Belgium (51° 3′ N., 3° 42′ E.), at confluence of Scheldt and Lys, 32 m. N. W. of Brussels; broken up by canal into about forty islands, and has over 200 bridges. Pop. 1921, 165,110. It flourished from middle of 12th cent. till early 16th cent., and was great weaving center. In spite of a stormy history has retained much of its ancient splendor, chief buildings being cathedral of St. Bavon (11th cent.), with *Adoration of the Immaculate Lamb* by brothers van Eyck; church of St. Nicholas (rebuilt 13th cent.); Château des Comtes de Flanders (9th cent.); hôtel de ville (1482); cloth hall (1325); state univ., etc. Commercial traffic of city very considerable owing to its rivers and canals, and has increased since extension of docks. Chief industries, woolens, linen, cotton, lace manufacture, leather work; paper mills, iron foundries, and engine factories. Ghent lay to N. of tide of Ger. invasion of Belgium and N. E. France (Aug.-Sept., 1914), and the enemy made no attempt at that time to occupy it. On Sept. 6, however, 5,000 Ger. infantry appeared near the town, and encountered stout resistance from Belgian troops entrenched between Scheldt and railway to Malines. The following day General von Boehn called upon burgomaster to surrender under threat of bombardment; and on the 8th, convention was signed whereby they promised not to bombard town on condition that Belgian troops there were withdrawn and civic guard disarmed, and grain, fodder, and petrol supplied to Ger. troops. After fall of Antwerp and retirement of Belgians and British along coast towards Fr. frontier, Ghent

was evacuated (Oct. 11-12). It was left an 'open city,' and on following day Germany arranged for its 'peaceful occupation.' It was for four years in enemy hands, but was recovered by Belgians in final stage of grand Allied offensive in autumn, 1918, and was entered on day Armistice was signed (Nov. 11).

GHENT, TREATY OF, treaty which terminated the war of 1812 between Great Britain and the United States. It was signed Dec. 24, 1814, and ratified on Feb. 17, 1815. It was more favorable to the United States than that country might reasonably have expected, considering its general conduct of the war, which had been disastrous on land and was only redeemed by the glorious exploits of the American navy. The advantageous terms secured were due in part to the fact that the American negotiators, John Quincy Adams, Henry Clay, James A. Bayard, Jonathan Russell and Albert Gallatin, were men of first class ability, while the British representatives, William Adams, Henry Goulborn and Lord Gambier, scarcely rose above mediocrity.

Many questions that had provoked the war, such as the right of impressment, of blockades, British navigation of the Mississippi and others, were ignored or left for future adjustment. The status quo of almost all territorial possessions was restored; both nations bound themselves to try to suppress the slave trade, and commissions were appointed to settle controverted boundary claims. In general, it may be said that the United States gained all that it desired and much more than it expected from the treaty.

GHENT, WILLIAM JAMES (1866), an American Socialist writer; *b.* in Frankfort, Ind. After graduating from the New York high school he began work as a compositor in a printing shop, later becoming sub-editor of various labor journals. In 1906 he became secretary of the Rand School of Social Science in New York, an institution established by Socialist sympathizers for the training of young people in Socialist doctrine. His writings are generally arguments for the Socialist theories, though during the war with Germany he withdrew from the Socialist Party on account of its stand against the war. He has written *Our Benevolent Feudalism*, 1902; *Mass and Class*, 1904, and *Socialism and Success*, 1910.

GHERARDI, BANCROFT (1873), an American telephone engineer; *b.* in San Francisco, Cal. He graduated from Polytechnic Institute of Brooklyn, N. Y., in 1891, continued his studies at the Cornell University school of engineering, after which he took a position as engineer's assistant in the New York Telephone Co., in 1895. Since 1920 he has been a vice-president of the American Telephone & Telegraph Co.

GHETTO, Jewish quarter in a city; sometimes called the 'Jewry.'

GHIBERTI, LORENZO (*c.* 1378-1455), Ital. sculptor and metal-worker; his masterpiece consists of the bronze doors of the Baptistery, Florence.

GHIKA, GHYKA, GHICA, family important in Rumanian history; apparently of humble origin, coming from Albania; founder was George, Prince of Moldavia and Walachia, 1659-64, from whom are derived various branches.

GHILAN, GILAN OR GUILAN (37° 30′ N., 49° E.), province, N. Persia, bordering Caspian Sea; vast forests; swampy and unhealthy on coast; soil fertile, well-watered, and cultivated; produces rice, wheat, and fruit; silk-culture an important industry; good fisheries; capital, Resht. Pop. *c.* 200,000.

GHIRLANDAJO, DOMENICO DEL (1449-94), Ital. fresco painter; *s.* of Tomasso Bigardi; apprenticed to goldsmith, and from making *ghirlande* earned name, his best work being the scenes, which he painted with his bro. David, from the lives of St. John the Baptist and the Virgin Mary in Santa Maria Novella, Florence; had as pupil Michelangelo; his portrait of Giovanna Tournabuon one of the supreme achievements in whole portraiture of Italian Renaissance. His bro. Benedetto was also a distinguished artist.

GHIRLANDAJO, RIDOLFO (1483-1560), Ital. artist; *s.* of Domenico G.

GHOR, GHUR (*c.* 33° 2′ N., 63° 12′ E.), ancient kingdom of Afghanistan, constituting mountainous district E. of Herat; little known of history of G. except when interwoven with that of Ghazni; capital in XII. cent., Firoz Koh; extensive ruins found in Murghab valley, at Taiwara, and elsewhere. Besides other streams, the Hari-rud, Farah-rud, and Khash-rud originate in G.; valleys generally well cultivated.

GHOST, see SPIRITUALISM.

GHOST DANCE, a religious ceremony among the Piute Indians. It originated about 1889 and arose from the belief that a leader would appear who would drive the white men from the land. It spread through other tribes and was the indirect cause of the Sioux outbreak of 1890-91.

GIANNUTRI (42° 15′ N., 11° 5′ E.) small island (ancient *Dianium*) in, Mediterranean, off S. W. coast Tuscany, Italy.

GIANT POWDER. See EXPLOSIVES.

GIANTS, the Titans and Cyclops of classical myth., ogres of fairy tales, etc. 'Giantism' is abnormal development, and may be regarded as a disease. Modern g's are often delicate, in many ways defective, and usually die young.

GIANT'S CAUSEWAY (55° 14′ N., 6° 13′ W.), group of columnar basaltic rocks on N. coast of Antrim, Ireland.

GIAOUR, Turk. name for infidel, (*i.e.,*) person not of their religion.

GIBARA, JIBARA (21° 4′ N.; 76° 20′ W.), city, Cuba, on N. coast; exports woods, tobacco, sugar. Pop. 8,000.

GIBBON, EDWARD (1737-94), Eng. historian; *b.* Putney, Surrey, of good and rather wealthy family; suffered from weak health until 1752; went to school at Kingston-upon-Thames 1746; returned home, 1747, on mother's death, and continued to develop a love of wide reading; went to Westminster School, 1749. In 1751 G. first started his interest in Rom. history by casually picking up a continuation of Echard's Rom. history; matriculated as gentleman commoner at Magdalen Coll., Oxford, April, 1752. At Oxford he was temporarily converted to the Church of Rome, but the system not suiting him, and his conversion offending his *f.*, he left Oxford and was placed under the tutelage of M. Pavilliard, a Calvinist minister of Lausanne. Here he read systematically and wisely under shrewd guidance. In 1754 he returned to Protestantism.

In 1761 he published *Essai sur l'etude de la litterature.* He became a captain in the Hampshire Militia, June, 1759, and from 1760 to 1762 was in 'Military Servitude.' During the years 1763-65 he toured the Continent; at Rome he first conceived his immortal work, the *Decline and Fall of the Roman Empire,* 1764. In 1767 he joined with a young Swiss friend in writing a literary journal entitled *Memoires litteraires de la Grande-Bretagne.* In 1770 he wrote *Critical Observations,* an attack on a theory of Warburton's. The first vol. of the *Decline and Fall* appeared Feb., 1776. The famous chapters (15 and 16) produced a great clamor and a library of controversy. Gibbon wrote his *Vindication,* Feb. 1779. Meanwhile he had been elected M.P. for Liskeard, 1774. For some service to the Government he received, 1779-80, a seat at the Board of Trade and Plantations, with a sinecure salary of 800 pounds a year. He lost his seat for Liskeard, 1780, but was elected subsequently for Lymington. In April, 1781, the second and third quartos of his history were issued. G.'s salary disappeared after abolition of Board of Trade by Burke's Bill in 1782. He retired to Lausanne, Sept., 1783, and the History progressed. Volume iv. was completed in June, 1784. Volume v. took less than two years. Volume vi, begun May, 1786, was finished in thirteen months. G. returned to London, 1787, and in 1788 last three volumes of the history were published. In July he went to Switzerland. His *Memoirs* came out in 1789. He returned to England in June, 1793, and died at London after a painful illness.

GIBBON, JOHN (1826-96), an Amer soldier, *b.* in Pennsylvania. He graduated from West Point in 1847 and served through the Civil War, rising to the rank of major-general. He was retired in 1891.

GIBBONS, FLOYD (PHILLIPS) (1887), war correspondent; *b.* in Washington, D. C. Educated at Gonzaga College and Georgetown University. 1907 began newspaper work. Since 1912 was on staff of Chicago Tribune. In December, 1914, began work as war correspondent. In 1915 with Francisco Villa as correspondent. In March, 1916, reported Villa's raid on Columbus, New Mexico. Accompanied General Pershing on his dash into Mexico. Wrote articles on condition of troops on Mexican Border. In 1917 was London correspondent of Chicago Tribune. Passenger on S. S. Laconia, which was torpedoed and sunk off the Irish Coast in 1917 and cabled four thousand word account of disaster. Was war correspondent in France, 1918. Lost sight of one eye at Battle of Chateau Thierry. Foreign director of Chicago Tribune. Decorated by French and Italian governments.

GIBBONS, GRINLING (1648-1721) Anglo-Dutch wood carver and sculptor executed the Whitehall statue of James II.; chiefly celebrated for extreme beauty and delicacy of his wood-carving.

GIBBONS, HERBERT ADAMS (1880), an American writer; *b.* in Annapolis, Md. He graduated from the William Penn Charter School, in Philadelphia, in 1897, and from the Princeton Theological Seminary, in 1908, after which he was ordained a Presbyterian minister. Shortly after he began his career as a foreign correspondent for American papers and magazines, specializing

izing on international politics. Among his books are *The New Map of Europe*, 1914; *The New Map of Asia*, 1919; *France and Ourselves*, 1920; and *Bases of Anglo-Saxon Solidarity*, 1921.

GIBBONS, JAMES (1834-1921), an American prelate of the Roman Catholic Church; *b.* in Baltimore, Md. His early childhood was spent in Ireland, where he went to school. At the age of seventeen he returned to his native city and began his studies for the priesthood. In 1861 he was ordained a priest. Rising in rank within the church, he was appointed a cardinal, in 1886. At the time of his death he was the Primate of the Roman Catholic Church in the United States. He wrote *The Faith of Our Fathers*, *Our Christian Heritage*, *The Ambassador of Christ*, and *A Retrospect of Fifty Years*.

GIBBS, GEORGE (1870), author, illustrator; *b.* in New Orleans. 1886-1888 was at the United States Naval Academy. Studied art at the Art Students' League and Corcoran School of Art, Washington. Author and illustrator of *Pike and Cutlass*, 1900; *In Search of Mademoiselle*, 1901; *The Love of Monsieur*, 1905; *The Medusa Emerald*, 1907; *Tony's Wife*, 1909; *The Bolted Door*, 1911; *The Forbidden Way*, 1911; *The Maker of Opportunities*, 1912; *The Silent Battle*, 1913; *Madcap*, 1913; *The Flaming Sword*, 1914; *The Yellow Dove*, 1915; *Paradise Garden*, 1916; *The Secret Witness*, 1917; *The Golden Bough*, 1918; *The Black Stone*, 1919; *The Splendid Outcast*, 1920; *The Vagrant Duke*, 1921; *Youth Triumphant*, 1921.

GIBBS, JOSIAH WILLARD (1839-1903), distinguished Amer. physicist; *b.* New Haven; grad. and taught at Yale; honored by London Royal Soc.

GIBBS, OLIVER WOLCOTT (1822-1908), an American physicist and chemist; *b.* in New York City. He graduated from Columbia University, in 1841, and from the College of Physicians and Surgeons there, in 1847. From 1849 until 1863 he was professor of physics and chemistry at the College of the City of New York, after which he was for twenty-four years Rumford professor of chemistry at Harvard University. He ranked at the head of the men in his field during his time and made many contributions to science, especially through his researches in vapor densities. Wolcott Gibbs Laboratory, at Harvard University, is named from him.

GIBBS, SIR PHILIP, war correspondent and novelist; at twenty-one years of age became an editor with Messrs. Cassell and Co., publishers, London; entered journalism, 1902, and was successively on the literary staff of Daily Mail, Tribune, and Daily Chronicle; war correspondent with Bulgarian army, 1912, with Fr. and Belgian armies, 1914, and with Brit. army in France and Flanders, 1915-18, his daily articles giving a vivid and sustained description, particularly of the human side of war; knighted in 1920; author of several books about the World War, and novels, notably *The Street of Adventure* (Fleet Street). He lectured in the United States in 1921 and 1922.

GIBEON, modern El-Jîb (31° 51′ N., 35° 12′ E.), ancient town, Palestine.

GIBEONITES, people of Gibeon, Hivite town, Palestine, *c.* 6 miles N. W. of Jerusalem; deceived Joshua, and were made helots.

GIBRALTAR, a rocky peninsula and Brit. crown colony (36° 6′ N., 5° 21′ W.), at most southerly point of Andalusia commanding the Mediterranean gateway; connected with Spain by a sandy isthmus (about 1¾ m. long and half a mile wide), the middle part being neutral ground between Span. and Brit. frontiers; *c.* 16 m. from African coast. Gibraltar rises almost precipitously 1,400 ft., with exception of western side on Bay of Gibraltar; length, 3 m. from N. to S.; breadth, ¾ m.; area, 1⅞ sq. m. Town lies on W. side, and consists of N. and S. town, with several churches, ruined Moorish castle, 10th cent., old Franciscan convent, governor's residence, extensive barracks, Alameda Gardens, cable station; powerful lighthouse on Europa Point (the southern extremity), and large harbor. Gibraltar is a naval base, strongly fortified, a good coaling-station, and a place of great strategic importance; the climate hot, but not unhealthy; industries unimportant.

Many interesting large caverns (*e.g.*, Hall of St. Michael), with stalactite pillars. Gibraltar is the only part of Europe where a species of cinnamon colored tailless ape (Barbary ape) is preserved.

Gibraltar was known to Greeks as *Calpe*, one of the Pillars of Hercules; strongly fortified by Târik-ben-Zaïd at Moorish invasion of Spain, A. D. 711, and called Jebel-al-Târik (hill of Târik); name gradually degenerated into Gibraltar; finally taken from Moors by Spain, 1462; captured by Brit. fleet under Admiral George Rooke during War of Span. Succession, 1704; several attempts made by Spain and France to retake Gibraltar, the last great siege being in 1779-82, when it was heroically defended by Sir George Eliott (afterwards Lord Heathfield). Since Peace of Versailles, 1783, Britain's claim to

Gibraltar has been unchallenged; is administered by a governor. Pop. 19,000 civilians. During the World War the Strait was guarded by the Gibraltar Patrol. See MAP SPAIN.

GIBSON, CHARLES DANA (1867), an American illustrator; *b.* in Roxbury, Mass. He acquired his technical education in the Art Students' League of New York. He has done much illustrating in both magazines and books. In 1920 he took active charge of the magazine 'Life,' after having acquired a half-interest in it. His cartoons depicting typical American characters are especially well known. Among his groups of sketches appearing in book form are *A Widow and Her Friends*, 1901; *The Social Ladder*, 1902; and *The Education of Mr. Pipp*.

GIBSON, HARVEY DOW (1882), banker; *b.* in New Hampshire. Bachelor of Arts of Bowdoin College in 1902 and Doctor of Laws in 1919. Was assistant manager of financial department of American Express Company in New York. In 1912 assistant to president of Liberty National Bank, of which he later became vice-president and president. Was president of Liberty Industrial Corporation. Was director of Interborough Rapid Transit Company, Beech-Nut Packing Company, Royal Indemnity Company, Wright Aeronautical Corporation, Pacific Fire Insurance Company. Officer of Legion of Honor, France, and Commander of Order of the Crown, Belgium.

GIBSON, JOHN (1790-1866); Brit. sculptor; *s.* of a Welsh market-gardener; befriended by Roscoe, the historian; went to Rome, where he studied under Canova. His classical studies are distinguished by great beauty of form; he sometimes used color in his statuary, and *The Tinted Venus* is one of his best-known works. He was very successful in modern statues of Queen Victoria and others.

GIBSON, WILLIAM HAMILTON (1850-1896), an American writer and illustrator; *b.* in New York City. He received his education in the Polytechnique Institute, in Brooklyn, N. Y., and soon after graduating began making botanical drawings for Harpers' Magazine and other periodicals. These were delicately tinted in a few colors and attracted considerable attention. Later he also exhibited water colors of landscapes and flowers, and illustrated books whose text he also supplied. Among these latter are *Camp Life in the Woods*, 1876; *Highways and Byways*, 1883, and *Our Native Orchids*, 1895.

GIDDINGS, FRANKLIN HENRY (1855), an American sociologist, *b.* in Sherman, Conn. He graduated from Union College, in 1877, was for ten years engaged in journalism, and then began teaching as professor at Bryn Mawr College. He stands in the fore rank of American sociologists. Since 1906 he has been professor of sociology and the history of civilization at Columbia University. Among his books are *The Theory of Sociology*, 1894; *The Theory of Socialization*, 1897; *Democracy and Empire*, 1900; *Descriptive and Historical Sociology*, 1906; *Pagan Poems*, 1914, and *The Responsible State*, 1918.

GIDDINGS, JOSHUA REED (1795-1864), a U. S. congressman; *b.* in Athens, Pa. He studied law and began to practice in Ohio, in 1820. In 1838 he was elected to Congress, where he soon acquired distinction as a bitter opponent of the institution of slavery. In his fiery speeches he again and again predicted the coming struggle between the North and the South over the question of slavery. In 1861 he was sent to Canada as United States Consul-General. He wrote *The Exiles of Florida*, 1858, and *The Rebellion; Its Authors and Its Causes*, 1864.

GIDEON, judge of Israel; destroyed Baal altar at Ophrah, and was called Jerubbaal; summoned by Jehovah to free Israelites from oppression of Midianites, whom he defeated with a small force.

GIERS, NICHOLAS KARLOVICH DE (1820-95), Russ. politician; minister plenipotentiary in Persia, 1863; foreign minister, 1882-94; cultivated friendship of Germany, Austria, Italy.

GIESSEN (50° 34′ N., 8° 41′ E.); town, on Lahn, Hesse-Darmstadt, Germany; seat of univ., founded 1607; tobacco, cotton, and woolen manufactures. Pop. 35,000.

GIFFEN, SIR ROBERT (1837-1910); Brit. statistician; after experience as financial edit. of The Times and other journals, he entered the Board of Trade becoming Controller-Gen., 1892; pub. *Essays on Finance, The Case Against Bimetallism, The Growth of Capital*.

GIFFORD, ADAM (1820-87), a Scottish judge and philanthropist, attended Edinburgh University, was called to the bar in 1849, and soon acquired an extensive practice. Appointed sheriff of Orkney and Shetland in 1865, he was five years later raised to the bench with the title of Lord G. At his death he left generous endowments to the universities of Edinburgh (25,000

pounds), Aberdeen and Glasgow (20,000 pounds) each, and St. Andrews (15,000 pounds) for the foundation of lectureship in natural theology. The lecturers, he stipulated, were to be submitted to no qualifying religious test whatever. Andrew Lang was one of the first appointed.

GIFFORD, FANNIE STEARNS DAVIS (1884), author; *b.* in Cleveland, Ohio. Bachelor of Arts of Smith College in 1904. At Kenosha, Wisconsin, in the Kemper School, teacher of English from 1906-1907. Member of the Poetry Society of America. Author of *Myself and I*, 1913; *Crack o' Dawn*, 1915. Writes poetry and stories for leading periodicals.

GIFFORD, ROBERT SWAIN (1840-1905), an American artist; *b.* on Naushon Island, Mass. He studied under Albert Van Beest, in Holland, then traveled extensively, making a trip through the wilds of California and Oregon in 1869. He specialized in landscapes, among his best works being *A Lazy Day in Egypt*, *Near the Coast*, *The Rock of Gibraltar*, and *Ocean Sand Dunes*.

GIFFORD, WILLIAM (1756-1826), Eng. journalist; first edit. of Quarterly Review, 1809-24; notorious for severe criticisms of Keats, Hazlitt, Shelley, Wordsworth, and other writers; edited Jonson and other Elizabethans.

GIFFORD LECTURES, see GIFFORD, ADAM.

GIFT, legal term; necessary elements, clear intention to give an actual transfer of subject to donee; written deed advisable.

GIFU (35° 12′ N.; 136° 45′ E.), town, Central Nippon, Japan; silk and paper manufactures. Pop. 58,000.

GIGLIO, ancient *Igilium* (42° 22′ N., 10° 53′ E.), island, off S. W. coast of Italy.

GIJÓN (43° 35′ N.; 5° 44′ W.), seaport, Oviedo, Spain, on Bay of Biscay; one of best roadsteads on Span. coast; has some fine buildings; manufactures tobacco, earthenware, glass; export minerals and fruit; favorite sea-bathing resort. Pop. 56,000.

GILA, a riv., nearly 500 m. long, of the United States, which rises in the Sierra Madre Mts., and after a southwesterly and southerly course reaches Arizona, whence it turns westward into the Colorado, the confluence being some 75 m. above the mouth of that river in the Gulf of California.

GILA MONSTER, the popular name for the poisonous lizard called *Heloderma suspectum*, which frequents the sandy wastes of Arizona, Texas, and New Mexico. In color it is bright orange and black, and its victims are chiefly birds and small mammals.

GIL BLAS, see LE SAGE.

GILBERT, CHARLES ALLAN (1873), painter; *b.* in Hartford, Connecticut. Educated in the Hartford public schools. Student in the Art Students' League, New York, and Julien Academy, Paris. His landscapes and figures include, *Overheard in the Whittington Family*, *Portfolio of Heads*, *Collection of Heads in Color*, *Separate Drawings in Color*, *All is Vanity*, *The Honeymoon*, *A Message from Mars*, *Women of Fiction*. During the World War was a ship camoufleur in 1917-1918. Inventor of new form of moving pictures, combinations of animated drawings and living actors.

GILBERT, FOLIOT (*d.* 1187), Eng. bp.; supported Matilda against Stephen; rival to Becket; bp. of Hereford, 1148, of London, 1163.

GILBERT, SIR HUMPHREY (*c.* 1539-83), Eng. sailor; joined fruitless voyage of discovery, 1578; took Newfoundland, 1583; founded Eng. colony at St. John's, and was drowned on way home.

GILBERT OR KINGSMILL ISLANDS (0° 175° E.), archipelago in Pacific; belongs to Britain.

GILBERT, SIR JOHN (1817-97), Eng. painter of hist. pictures, including 'Joan of Arc,' 'Murder of Becket,' 'Agincourt,' etc., hence called 'the Scot of painting;' also celebrated for illustrations of Shakespeare.

GILBERT, SIR JOSEPH HENRY (1817-1901), Brit. chemist; valuable research in agricultural chemistry; instituted nitrogen treatment of soil.

GILBERT, MARIE DOLORES ELIZA ROSANNA, LOLA MONTEZ (1818-61), Irish adventuress; achieved fame as a 'Spanish' dancer; became mistress of Ludwig I. of Bavaria; banished; subsequently performed in America and Australia; devoted her last years to the care of female outcasts.

GILBERT, OR GYLBERDE, WILLIAM (1540-1603), physician to Queen Elizabeth, and a careful and accurate chemist. He studied terrestrial magnetism and wrote the earliest treatise on magnetism, a very valuable work.

GILBERT, SIR WILLIAM SCHWENCK (1836-1911), Eng. play-

wright and humorist; won distinction with his *Bab Ballads* and such plays as *Pygmalion and Galatea* and *Dan'l Druce*; became world-famous as librettist in conjunction with Sir Arthur Sullivan; their comic operas include *H.M.S. Pinafore*, *The Pirates of Penzance*, *Patience*, and the immortal 'Savoy' series—*Iolanthe*, *The Mikado*, *The Yeomen of the Guard*, *The Gondoliers*, etc.; knighted, 1907; pub. *Original Plays*, 1886-95, and *Original Comic Operas*, 1890.

GILBERT AND ELLIS ISLAND COLONY, a group of islands including the Gilbert and Ellis Island, and other small groups, protectorates of Great Britain. The protectorate was established in 1915. The colony includes in addition to the Ellis and Gilbert Islands, the Union group, Fanning Island, Washington Island, and Christmas Island. The chief products are fruits and coconuts. Pop. about 30,000.

GILBERT OF SEMPRINGHAM, ST. (*d.* 1189), Eng. ecclesiastic; founder of the Gilbertine Order of canons regular and nuns.

GILBOA (cor. probably of Heb. *Gib'ath habba'al*, hill of Baal), a chain of hills in Palestine between the plains of Esdraelon and the valley of the Jordan, now called Jebel Fukua. Famous for being the scene of the death of King Saul and his three sons after the Philistines had defeated them.

GILDAS, GILDUS (*c.* 516-70), earliest Eng. historian; wrote *De excidio Britanniae liber querulus*, history of Britain from Rom. invasion to VI cent.

GILDER, JEANETTE LEONARD (1849-1916), an American editor and literary critic; *b.* in Flushing, N. Y. She began her journalistic career at the age of twenty, shortly after becoming a member of the editorial staff of Scribner's Monthly, which later became the present Century Magazine. For some years she was also on the staff of the New York Herald as literary, dramatic and musical critic. In 1881 she and her brother, J. B. Gilder, founded the magazine The Critic, which soon took rank as one of the foremost periodicals of its kind. She was the author of *Taken by Siege*, 1886; *The Autobiography of a Tomboy*, 1900, and *The Tomboy at Work*, 1904.

GILDER, JOSEPH B. (1858), journalist; *b.* in Flushing, N. Y. Was a student at the United States Naval Academy from 1872-1874. From 1874-1877 was a reporter in New Jersey. Wrote New York letters to Boston Advertiser, Buffalo Courier. From 1877-1880 was reporter and assistant city editor of New York Herald. In 1881, with his sister, started The Critic, which later became Putnam's Magazine. Co-editor for 28 years. From 1893-1901 president of The Critic Company. Treasurer of the American Copyright League, 1886. First secretary of the Universal Settlement Company. Writes poetry and prose for magazines. From 1895-1902 was literary adviser to The Century Company. In London, 1902-1914, was United States Government dispatch agent. Editor, 1910-1911, of New York Times Review of Books; editor of J. R. Lowell's Impressions of Spain, Andrew Carnegie's Gospel of Wealth.

GILDER, RICHARD WATSON (1844-1909), an American editor and poet; *b.* in Bordentown, N.J. He served as a private in the Federal Army during the Civil War, after which he took up newspaper work, becoming editor of the Newark, N.J. Advertiser. Later he became editor of 'Hours at Home,' and when that publication was merged with Scribners' Monthly, in 1870, he remained on the staff. After this latter publication became the present Century Magazine, he continued as editor for some years. He wrote, *Five Books of Song*, 1894; *In Palestine, and Other Poems*, 1898, and *Poems and Inscriptions*, 1901.

GILDER, WILLIAM HENRY (1838-1900), an American Arctic explorer, *b.* at Philadelphia, Pennsylvania, served as a private during the Civil War, retiring with rank of captain, and was managing editor of *Newark Register*, 1871. He acted as correspondent for *New York Herald* when accompanying Schwatka as second in command in search for Sir John Franklin. 1878-80, on the De Long Search Expedition of 1881; in Tonquin during the French-Anamese War, 1883, and in the Spanish earthquakes, 1884. He wrote *Schwatka's Search*, 1881; *Ice Pack and Tundra*, 1883.

GILDERSLEEVE, BASIL LANNEAU (1831-1924), an American philologist; *b.* in Charleston, S. C. He graduated from Princeton, in 1849, after which he continued his studies in the universities of Berlin, Bonn and Göttingen. For over twenty years he was professor of Greek and Latin in the University of Virginia, and from 1876 until 1915 he was professor of Greek at Johns Hopkins University. In the latter year he retired and devoted himself entirely to the editorship of the American Journal of Philology, which he founded in 1880. He is the author of a number of Latin

and Greek text books, and of *The Creed of the Old South*, 1915.

GILDERSLEEVE, VIRGINIA CROCHERON (1877), college dean; *b.* in New York. Educated at Brearley School and Bachelor of Arts at Barnard University in 1899. At Columbia College in 1900 was Master of Arts and 1908 was Doctor of Philosophy. In 1916 at Rutgers College was Doctor of Laws. Instructor of English, 1900-1907, 1908-1910, assistant professor 1910-1911. Since 1911 professor and dean of Barnard College (Columbia University). Director of Misses Masters School, Brearley School. Member of National Institute Social Science, National Civic Federation, Modern Languages Association, Classical Association of the Atlantic States, College Settlement Association, New York Peace Society. Member of Phi Beta Kappa. Author of *Government Regulation of the Elizabethan Drama*, 1908.

GILDING, the art of decorating objects with leaf or powdered gold, is of very early origin, and was practiced by the Hebrews, Romans, and other ancient nations. The modern methods are of various kinds, but in the best gilt-work the surface is carefully prepared with adhesives and other substances, after which gold leaf is applied.

GILEAD (*c.* 32° 25′ N., 35° 58′ E.), mountainous region, E. of Jordan, Palestine; general elevation, 2,500 ft.; highest point, Ramoth-Gilead, 3,597 ft.

GILES, ST., GIL OR GILLES, abbot who founded hermitage of St. Gilles, France; lived about VII cent.

GILFILLAN, GEORGE (1813-78), Scot. author and lecturer; pub. *Gallery of Literary Portraits, Martyrs and Heroes of the Scottish Covenant.*

GILFILLAN, ROBERT (1798-1850), a Scottish poet, *b.* at Dunfermline. Best remembered by his smart, humorous satire *Peter M'Craw*, 1828; and the songs *Fare thee well; Why lift I my hame?* See collected edition of his works, 1851, with prefatory biography.

GILGAL, various places in Palestine. Most noted was sacred site near Jericho; another is in Sharon, a third near Bethel.

GILGAMESH, legendary regal hero of a Babylonian epic, who, stricken with disease, applies to Ut-napishtim, a survivor of the Deluge, for a cure. The latter refers him to an herb which gives immortality, but he is robbed of this by an evil spirit.

GILGIT (35° 54′ N., 74° 23′ E.), an outlying province in extreme N. W. of India, under sovereignty of Kashmir, and embracing part of basin of river Gilgit; mountainous country, intersected by narrow valleys and with numerous glaciers and ice-fields; separated from Chinese frontier by mountain range; station of Gilgit stands *c.* 4,890 ft. above sea-level. People are a mixed race, speaking different languages, but generally classed under name of Dards. Pop. *c.* 17,000.

GILL (Old Fr. *gille*, Lat. *gillo* or *gella*), originally a wine measure, now reckoned as ¼ of a pint. This is the standard use of the world; in some parts of Britain, principally in Scotland and the N. of England, only two Gs. were reckoned to a pint.

GILLETT, FREDERICK HUNTINGTON (1851), congressman and speaker; *b.* at Westfield, Mass. Bachelor of Arts, 1874, Master of Arts, 1877, Doctor of Laws, 1906, of Amherst College. Bachelor of Laws in 1877 of Harvard College. Practiced law at Worcester, Mass., since 1877. Assistant attorney general of Massachusetts, 1879-1882. In 1890-1891 member of Massachusetts House of Representatives. Member of Congress from 1893-1921. Since May, 1919, Speaker of House.

GILLETTE, WILLIAM HOOKER (1855), an Amer. actor and playwright; *b.* in Hartford, Conn. In his youth he took special courses at the University of New York and the Massachusetts Institute of Technology, at the same time playing in stock companies. Among the plays in which he acquired his popularity are *The Admirable Crichton, A Successful Calamity* and *Dear Brutus.* Among the plays he has written himself are *Esmeralda, Held by the Enemy, Too Much Johnson,* and *Sherlock Holmes.*

GILLINGHAM—(1) (51° 2′ N., 2° 17′ W.), market town, Dorsetshire England. Pop. 3,380 (2) (51° 18′ N. 0° 33′ E.), town on Medway, Kent England; brick and tile manufactures Pop. 1921, 54,038.

GILLMORE, INEZ HAYNES (1873), an American author; *b.* in Rio de Janiero, Brazil. She graduated from the Normal School of Boston and then for three years took special courses at Radcliffe College. For some years she corresponded for American magazines from abroad. Together with Maud Wood Park she founded the National College of the Equal Suffrage League. Among her books are *June Jeopardy*, 1908; *Angel Island*, 1914; *The Lady of Kingdoms*, 1917; *The Native Son*, 1919, and *The Story of the Women's Party*, 1921.

GILLMORE, QUINCY ADAMS (1825-1888), an American soldier; *b.* in Black River, Ohio. He graduated from the West Point Military Academy in 1849, and engaged in active service during the Civil War, showing such engineering skill in the capture of Fort Pulaski, in April, 1862, that he was made brigadier-general. During 1863 he had command of the Department of the South. In July, 1863, he led a successful attack on Morris Island, then began bombarding Fort Sumter and Charleston, in August. In September he took Fort Wagner. He had command of the Tenth Corps near Richmond, in 1864, and after the war was brevetted a major-general in the regular U. S. Army.

GILLRAY, JAMES (1757-1815), Eng. caricaturist; *s.* of soldier. The chief butts of his satire, apart from social follies, were George III. and Napoleon.

GILLS. See FISHES.

GILLYFLOWER, originally meant the *clove, Dianthus caryophyllus,* used in spiced wine. *Stock* and many *Cruciferae* are now called G's.

GILMAN, CHARLOTTE PERKINS (1860), an American writer; *b.* in Hartford, Conn. She began her public work in 1890, lecturing on ethics, economics and sociology, later contributing articles on similar subjects to the magazines, as well as stories and poems. She has been especially identified with the labor question and the advance of women. From 1909 to 1916 she was editor of The Forerunner. Among her works are *Women and Economics,* 1898; *The Yellow Wallpaper,* 1899; *The Man-Made World,* 1910, and *Moving the Mountain,* 1911.

GILMAN, DANIEL COIT (1831-1908), an American university president *b.* in Norwich, Conn. He graduated from Yale University, in 1852; was professor of physical and political geography there, during 1856-72, and president of the University of California during 1872-5. In that latter year Johns Hopkins University was established and he became its first president, in which position he remained until 1901. He has written *The Life of James Monroe,* 1883; *Democracy in America* and *The Life of James Dwight Dana.*

GILMAN, NICHOLAS PAINE (1849-1912), American clergyman, author and educator; *b.* Quincy, Ill. He graduated from Harvard Divinity School in 1871, held pastorates in Unitarian churches in Massachusetts until 1878 and held the chair of English in Antioch College, Ohio, from 1878 to 1885. He was assistant editor of the Unitarian Review, 1885-89, and editor of the Literary World, 1889-95. In 1895 he became professor of sociology and ethics in the Meadville (Pa.) Theological Seminary. He edited the New World from 1892 to 1900. His publications include *Profit Sharing Between Employer and Employee,* 1889; *Socialism and the American Spirit,* 1893; *A Dividend to Labor;* 1899; *Methods of Industrial Peace,* 1904.

GILPIN, BERNARD (1517-83), 'Apostle of the North,' was so-called from his preaching excursions in the N. counties of England; rector of Houghton-le-Spring, Durham.

GIMP, a kind of silk, woolen or cotton twist, stiffened by a fine wire, or sometimes by a coarse thread which runs through it. It is much used as a trimming for dresses.

GIN, see SPIRITS.

GINGER, the dried and scraped root of *Zingiber officinale,* natural order, *Scitamineae,* comes from the E. and W. Indies in branched pieces 3 inches long, of pale buff, striated, fibrous appearance; has an agreeable aromatic odor and a strong pungent taste; is used as a *stomachic, carminative,* and flavoring agent.

GINGER BEER, a weak alcoholic effervescing beverage, containing less than 2 per cent. of alcohol, prepared by pouring boiling water over crushed ginger root, filtering, and adding lump sugar, cream of tartar, and yeast. When fermentation is nearly complete, liquor is transferred to fresh cask, and ultimately to stone bottles. *Ginger Ale* is a somewhat similar effervescing drink.

GINGHAM, a variety of printed cotton cloth.

GINGI, GINGEE (12° 16′ N.; 79° 26′ E.), rock fortress, S. arcot, Madras, India.

GINGKO, the Japanese name for a genus of deciduous coniferous plants consisting of a single species, *G. biloba,* the maidenhair tree, which bears large, yellow, edible fruit and delicate foliage. The Japanese hold the tree as sacred and plant it round their temples.

GINKEL, GODART VAN (1630-1703), 1st Earl of Athlone; Dutch soldier; came to England with William of Orange; reduced Ireland to submission, 1691; distinguished in wars of Grand Alliance and Span. Succession.

GINSBURG, CHRISTIAN DAVID (1831-1914), rabbinical scholar of Polish birth; was one of the original members

for revision of Eng. version of O.T. His verdict on the Shapira MS. decided Brit.

GINSENG, is the root of *Panax ginseng*, natural order, *Araliaceae*, from Korea. Chinese believe it restores strength, but it has no pharmacological action.

GIOBERTI, VINCENZO (1801-1852), Ital. philosopher and statesman; became pres. of Chamber of Deputies; Prime Minister, 1849. G. wrote *Introduzione allo Studio della Filosofia* and other philosophical works.

GIOJA, MELCHIORE (1767-1829), Ital. economist and philosopher; imprisoned on charge of political conspiracy; his work was largely statistical; wrote several books.

GIOJOSA (38° 18′ N., 16° 25′ E.), small town, Calabria, Italy; corn, wine, Oil. Pop. 10,000.

GIOLITTI, GIOVANNI (1842), Ital. statesman; *b.* Mondovi, Piedmont; head of the Italian Treasury, 1889; premier and minister of interior, 1892, but had to resign owing to bank scandals; again minister of interior, 1901, and also premier, 1903-5, and 1906-14, when he was practically ruler of Italy; broke power of Socialism; became Conservative, and later Radical-Socialist; strove to keep Italy out of the World War, 1915, and was suspected of intriguing with the Germans. On the fall of the short-lived Nitti ministry, June, 1920, he again became prime minister.

GIORDANO, LUCA (1632-1705), Ital. artist; notorious for his rapidity with the brush; spent many years at the Span. court, where he acquired great wealth, which he afterwards distributed in charity.

GIORGIONE (*c.* 1477-1511), Ital. artist; *b.* Castelfranco; of obscure parentage; went to Venice in early youth, where he is said to have studied under Giovanni Bellini, and had Titian for a fellow-pupil; became one of the greatest masters of the Venetian school.

GIOTTO DI BONDONE (*c.* 1266-1337), Ital. artist and architect; *b.* Vespignano, near Florence. His works are chiefly frescoes, and deal with allegorical subjects or incidents from the lives of the saints. Fine examples of his work are twenty-eight frescoes illustrating the life of St. Francis, at Assisi; and other famous works showing his later development are to be seen at Rome, Padua, and Florence.

GIOVINAZZO, town, Bari, Italy; harbor on Adriatic; trade, brandy and ropes. Pop. 12,000.

GIOZA DEL COLLE, town, Reggio di Calabria, Italy; trade, wine and oil. Pop. 11,000.

GIPPSLAND, district, S. E. Victoria, Australia; area, *c.* 14,000 sq. miles; grazing and mining.

GIPSY. See GYPSY.

GIRAFFE FAMILY (*Giraffidae*); group of ungulate, antiodactyle ruminants, comprising two African genera, giraffes (*Giraffa*) and okapi (*Ocapia*), which have three bony, skin-covered skull prominences, separated from the bony substratum, one in front and two behind; feet are two-hoofed, no upper canines or incisors. Giraffes have a long tongue, long legs and neck—tallest of mammals—and browse on tall trees. Okapi have shorter necks and legs; male alone has horns, which at apex come through skin. *Palaeotragus* (or *Samotherium*) and *Sivatherium* are extinct forms, found in Lower Pliocene deposits.

GIRALDI, GIGLIO GREGORIO (1479-1552), Ital. scholar; learned Gk. under Chalcondylas and wrote works on classical lit. and antiquities.

GIRALDI, GIOVANNI BATTISTA (1504-73), Ital. poet; author of *Ercole* (epic), *Orbecche* and other tragedies, and *Hecatommithi* (short stories), some of which served as the basis of plays by Shakespeare and others.

GIRALDUS, CAMBRENSIS (*c.* 1146-1220), Welsh historian; wrote *Topographia Hibernica*, *Itinerarium Cambriae*.

GIRANDOLE, a table candelabrum with branching lights; usually of silver or other metal.

GIRARD, a town of Ohio, in Trumbull co. It is on the Erie, the Baltimore and Ohio, and the Pennsylvania railroads. There are important industries, including the manufacture of iron and steel products, leather and chewing gum. Pop. 1920, 6,556.

GIRARD COLLEGE, Philadelphia, Pa., institution founded by Stephen Girard for the education of poor white male orphans. Many unique provisions were made by the founder, the best known of which is perhaps that which forbids any clergyman ever to enter the institution. This was not designed primarily as a fling at religion but was due to the desire to keep the institution absolutely free from any clerical influence. Other provisions were that boys should be admitted between the ages of 6 and 10 and leave between 14 and 18, and that the education should be chiefly

practical and designed to fit the students for immediate employment. Stress is laid on elementary training in English, arithmetic, civics and mechanical trades. The college is a home as well as a school and the inmates are strictly supervised. The pupils number about 1,500. The institution is enormously wealthy, having buildings worth $4,000,000 and other property to the amount of $32,000,000. A large part of the income is derived from investments in Pennsylvania coal lands.

GIRARD, STEPHEN (1750-1831), American business man and philanthropist; *b.* Bordeaux, France. He ran away to sea in early boyhood and by the time he was 19 years old was captain and part owner of a trading vessel. He settled in Philadelphia, Pa., 1769, and by his trade ventures amassed a large fortune. He made additional profits by purchasing a large part of the stock of the first Bank of the United States after its charter had expired, and during the war of 1812 took the whole of a Government loan of $5,000,000. He was a shrewd, harsh, parsimonious business man, but possessed of marked patriotism and broad vision. At his death he left a fortune of $7,500,000, of which $5,260,000 was for the founding of an institution for the care and training of orphans, which is now Girard College.

GIRARDIN, DELPHINE DE (1804-55), Fr. poetess, novelist, and dramatist of some eminence. Her novels include *La Canne de Monsieur de Balzac*, and her plays, *Cleopatre*, *Lady Tartufe*, and Le Chapeau d' un horloger.

GIRARDIN, ÉMILE DE (1802-81), Fr. journalist; wrote novel *Emile*, supporting cause of illegitimate children, founded popular periodicals; *m.* Delphine Gay, the authoress.

GIRARDON, FRANÇOIS (1628-1715), Fr. sculptor; decorated Versailles Palace; chief work is Richelieu's tomb in the Sorbonne, Paris.

GIRART DE ROUSSILLON (IX. cent.), Burgundian hero of a XII.-cent. romance; famed, like his wife, Bertha, for valor and piety.

GIRASOL, mineral; usually called fire-opal; dark red.

GIRDER, a beam of steel or iron, resting on supports at either end and bearing a load which may be concentrated at one or more points, or distributed throughout its unsupported length; most general application of girders is in connection with steel or iron bridges of which they form chief component parts. They are also largely employed to carry floors and superincumbent walls of high modern buildings, and generally speaking to form horizontal weight-bearing members in every variety of steel and iron structure.

GIRGA, GIRGEH (28° 19′ N.; 31° 59′ E.), town, on Nile, Upper Egypt; has very ancient R. C. monastery; pottery. Pop. 18,000.

GIRGENTI (37° 18′ N.; 13° 23′ E.); town (ancient *Agrigentum*), Sicily; bp.'s see, cathedral; sulphur mines in vicinity. Pop. 28,000.

GIRISHK (31° 45′ N.; 64° 22′ E.); village and fort, on river Helmund, Afghanistan.

GIRL SCOUTS. An organization that has spread all over the civilized world. After Sir Robert Baden-Powell of Great Britain had organized the Boy Scouts, his sister suggested the forming of a girls association, on the same lines. In this country, Miss Juliette Low, of Savannah, Georgia, organized the First Patrol of Girl Guides and when in 1913 the headquarters were moved to Washington, D. C., the name was changed to Girl Scouts. The scout laws are Truth, Loyalty, Helpfulness, Cheerfulness, Friendliness, Kindness, Obedience, Purity, Thrift. In 1915, at a convention of Girl Scout leaders, a National Committee was formed which put the business of the National Organization in the hands of an Executive Committee. Each city, or locality, has a local committee of 12, or more members. The dues are 25 cents a year. In 1916 the National Headquarters were moved to New York. President in 1922, Mrs. Hoover. Director, Mrs. J. D. Rippin.

GIRNAR (21° 30′ N.; 74° 42′ E.); sacred hill, Kathiawar, W. India; numerous ruined Jain temples.

GIRODET DE ROUSSY, ANNE LOUIS (1767-1824), Fr. artist; pupil of David; pioneer of the romantic in Fr. art; amongst his best-known works are *Endymion*, *Danae*, and *Atala au Tombeau*.

GIRONDE (44° 50′ N.; 0° 30′ W.), maritime department, S. W. France, formed from part of old province Guyenne; chief rivers, Dordogne and Garonne; surface generally flat, W. portion along sea coast consisting of sandy dunes planted with pines, and interspersed with lagoons, from which large quantities of salt are obtained; extensive vineyards; some grain, vegetable, and fruit-growing; varied manufactures; chief product, wine; capital, Bordeaux. Area, 4,140 sq. miles. Pop. 1921, 819,404.

GIRONDISTS, Fr. political party in Revolutionary times, so called because several leading members represented province of Gironde; guiding spirit was Madame Roland, wife of a deputy; among conspicuous members were Brissot, Vergniaud, Condorcet, Guadet, Isnard, Gensonné, Barbaroux. They formed ministry in 1792; consented to king's death, but had no part in Sep. massacres, and wished to establish orderly government. The invasion of France by Austrians and Prussians threw chief power into hands of extremists, and in Convention formed for government of nation no G. was a member; their moderation had excited suspicion, and they fell victims to fanaticism of Committee of Public Safety, over forty being guillotined.

GIRTIN, THOMAS (1775-1802), Eng. artist; friend of Turner, and a pioneer of modern Eng. water color painting. His landscapes and etchings are valued by collectors.

GIRTON COLLEGE, Cambridge, England, college for women affiliated to Cambridge University.

GIRVAN (55° 14′ N.; 4° 51′ W.), market town, watering-place, Ayrshire, Scotland; herring fishing; weaving. Pop. 5,000.

GIRY, ARTHUR (1848-99), Fr. writer; wrote *Manuel de diplomatique*, part of *Monumenta Germaniae historica*; also produced new edit. of Theophilus's *Diversarum Artium Schedula*, and Carolingian chronicles.

GISBORNE (38° 45′ S.; 178° 1′ E.), seaport, on Poverty Bay, New Zealand; landing place of Captain Cook, 1769. Pop. 6,000.

GISSING, GEORGE ROBERT (1857-1903), Eng. novelist and critic; most of his novels deal with life's seamy side, but, in his later work, there was a brighter outlook. He also wrote a study of Dickens.

GITSCHIN (50° 27′ N.; 15° 23′ E.), town, Czecho Slovakia; scene of defeat of Austrians by Prussians, 1866. Pop. 10,000.

GIUGLIANO, town, Naples, Italy. Pop. 15,000.

GIULIO ROMANO, GIULIO DI PIETRO FILIPPO DE' GIANNUZZI (*c.* 1492-1546), Ital. artist and architect *b.* Rome; ed. under Raphael, and became, after his master, head of the Rom. school; assisted Raphael in many important works in the Vatican, and the *Battle of Constantine* and *The Apparition of the Cross* were entirely from his brush. Some of his greatest works were executed for the ducal palace at Mantua; he restored the Cathedral.

GIUNTA PISANO (*d. c.* 1235), Ital. painter, whose *Crucifix* (at Pisa) is treasure of archæology rather than art, lacked technique.

GIURGEVO, Rumanian Giurgiu (43° 53° N., 25° 56′ E.), town, river port, on Danube, Rumania; exports timber, grain. Pop. 15,000.

GIUSTI, GIUSEPPE (1809-50), Ital. satirical poet; writer of remarkably original gifts; first won notoriety with *La Ghigliotteria* ('The Guillotine'). Other works include *Gingillino*, an attack upon the Treasury administration, and *Sant' Ambrogio*.

GIUSTINIANI, AGOSTINO (1470-1536), member of notable Ital. family; pub. polyglot edit. of Psalter; prof. of Arabic and Hebrew at Paris. Gernardo G. (1408-89) wrote on Venetian history Lorenzo G. (1380-1465), patriarch in 1451. Pavlo G. (1444-1502) was famous preacher; wrote exegetical works. Vincenzo G. (XVII. cent.) formed art collection.

GIVENCHY (-LEZ-LA-BASSÉE), ruined vil., Pas-de-Calais, France (50° 33′ N., 2° 46′ E.), 2 m. W. of La Bassée; scene of much severe fighting in World War; occupied by Allies, Oct. 18, 1918; Ind. troops violently attacked by Germans, Dec. 20; feint attack by Brit. 1st Corps before battle of Neuve Chapelle, March 10, 1915, and before battle of Loos, Sept. 25, 1915; stoutly defended in battle of the Lys, April, 1918.

GIZEH: (1) A prov. of Upper Egypt. Area about 400 sq. m., with a pop. of 460,000. (2) a tn., situated on the l. bank of the Nile, some 3 m. S. of Cairo. It is near the Pyramids, which are about 5 m. to the W. The Sphinx and the ruins of Memphis are also in the immediate neighborhood. The Nile is crossed at this point by a bridge. Pop. 12,000.

GIZZARD, the part of the alimentary canal which is especially adapted for grinding food. The grinding is done in different ways by different creatures: the common fowl does it by the help of small stones which it has itself swallowed; the crayfish by means of teeth which grow on the G. itself. The Gs. of insects and those of birds differ very considerably in structure.

GLACE BAY (46° 12′ N., 60° W.), city, port entry, Cape Breton Island, Nova Scotia, Canada; coal fields. Pop. 7,000.

GLACIAL PERIOD, or Ice Age, sometimes called Pleistocene Period, but this term is generally used only in connection with the flora and fauna of the period.

The Glacial Period refers to that epoch of the post-Tertiary system during which nearly all parts of the globe N. of latitude 50° were under ice. The thickness of the ice mass was probably not less than 5,000 ft. Prof. James Geikie held that in Europe there were four periods of glaciation alternating with three inter-glacial periods. Traces of glacial action are found chiefly in the Highlands of Scotland, the Jura Mts., Black Forest, Himalayas, and N. America. The present Alpine glaciers are attenuated remains of the great ice streams of the Glacial Period. The most important member of the Glacial strata is the Boulder Clay, an unstratified clay in which are embedded boulders marked by glacial action, which may also be seen on rock surfaces and in *moulins* or Giants' Kettles.

The Glacial Deposits are developed on a large scale in N. America, where, as in Europe, the clays are separated by the interglacial deposits.

GLACIER is a large mass of snow which under pressure becomes granular and is finally transformed into dense clear ice, which still retains the granular crystalline structure. Snow collects above the snow-line, and when there is a certain weight moves downwards, reaching a point where the melting is not balanced by the *snow-fall,* (*i.e.,*) below the *snow-line.* Here it is termed a g., its form depending on the shape of the ground over which it flows.—Valley Glaciers are long and narrow.—Piedmont Glacier is a lobulated mass made by the convergence of long, narrow processes.—Cliff Glacier is formed in a hollow on the edge of a snow-field. The g. is fed from the snow-field and ends when the waste of ice is greater than the supply. The material which the g. collects after it leaves the snow-field, *morainic material,* is distributed by the streams. It is this debris which polishes the rocks, and the fragments it grinds off are called *boulder-clay* or *tile.* A *V-shaped* valley cut out by streams is transformed into a *U-shaped* valley by ice action.—Ice-Tables consist of large stones which prevent the ice below melting and remain on the top of an ice pillar. Small stones absorb heat, melt the ice, and sink into the g. When a g. reaches the sea portions break off and form icebergs.

GLACIER NATIONAL PARK, part of the national domain of the United States set apart by presidential proclamation as a public park in 1910. The park, which covers an area of 915,000 acres or about 1,450 square miles, lies just south of the Canadian border, includes part of Teton and Flathead Counties, Montana, and is roughly rectangular in shape. It derives its name from the number of glaciers scattered through the park. There are about 250 lakes in the area, many of them of entrancing beauty and most of them surrounded by high and majestic mountains. Five peaks rise to a height of more than 10,000 feet above sea level. The larger lakes are well stocked with fish, and wild game is plentiful. The park abounds in rushing streams and shimmering cataracts that make it a wonderland for the tourist. The most unique and imposing features of the area are the glaciers themselves, remnants of the great ice masses that in bygone ages covered the slopes and valleys. Some of them cover a space of several square miles and consist of solid ice of unknown depth.

GLACIS, natural, or artificial, slope outside a fortification.

GLACKENS, WILLIAM J. (1870), artist; *b.* in Philadelphia, Pa. Educated in the public schools. Studied in Europe and a student at the Pennsylvania Academy of Fine Arts. In 1896 exhibited at the Paris Saloon; 1900 at the Paris Exposition. Awarded gold medal at the Buffalo Exposition, 1901. At the St. Louis Exposition, 1904, silver and bronze medals. Member of Society Independent Artists, Society American Illustrators, Society American Painters and Sculptors.

GLADBACH, OR BERGISCH-GLADBACH (51° N., 7° 8′ E.), town, Rhenish Prussia, Germany; paper and metal industries. Pop. 15,000.

GLADBACH, OR MÜNCHEN-GLADBACH (51° 33′ N., 6° 25′ E.), town, Rhenish Prussia, Germany; center of cotton industry. Pop. 65,000.

GLADDEN, WASHINGTON (1836-1918), Congregational clergyman and author; *b.* in Pottsgrove, Pa.; died at Columbus, Ohio. Graduated from Williams College in 1859 and after ordination in the Congregational Church held several pastorates, becoming minister of the First Congregational Church, Columbus, Ohio, in 1882; pastor emeritus, 1914. In 1905 was widely known for his strictures on 'tainted money,' opposing J. D. Rockefeller's gift of $100,000 to the Foreign Mission Board of the Congregational Church. Although the Mission Board overruled Mr. Gladden's opposition, he continued

his crusade against ill-gotten money. As a reformer he was made a member of the City Council of Columbus. Among his publications are *Workingmen and Their Employers*, 1876; *The Young Men and the Churches*, 1885; *Applied Christianity*, 1887; *Burning Questions*, 1889; *Social Facts and Forces*, 1897; *Social Salvation*, 1901; *Christianity and Socialisms*, 1905; *The New Idolatry*, 1905; *Recollections*, 1909; *The Labor Question*, 1911, and *Live and Learn*, 1914.

GLADIATORS, professional combatants who fought in arena of Rom. theaters; practice began in 264 B. C. at Rome, and spread throughout Rom. Empire, until no town of any size was without its gladiatorial combats. G's were generally slaves, prisoners of war, or condemned criminals. When a g. was so wounded as to be unable to fight any longer, his antagonist stood over him with uplifted sword ready to slay him if the spectators willed his death, which they indicated by turning their thumbs inwards. Constantine issued a decree against the barbarous practice in 325, but it did not entirely cease until the time of the Emperor Theodoric, about 500 A. D.

GLADIOLUS, a genus of herbaceous monocotyledonous plants, natural order *Iridaceae*, belonging to the mountains of the S. hemisphere. The *corm* is solid and fibrous, the leaves long and narrow, the flowers form a terminal *spike*, are funnel-shaped with the wide end upwards.

GLADSHEIM (Scandinavian myth.), the dwelling place of Odin, which embraces also Valhalla.

GLADSTONE (23° 50′ S., 151° 15′ E.), seaport, Clinton Bay, Queensland, Australia; gold and manganese mines.

GLADSTONE, HERBERT JOHN, VISCOUNT (1854), English politician, youngest son of William Ewart Gladstone; was history lecturer at Keble Coll., Oxford, from 1877 till 1880, when he succeeded his father as M.P. for Leeds, continuing to represent a division of that city from 1885 to 1910. He was financial secretary to War Office, 1886; under-secretary to Home Office, 1892-4; first commissioner of works, 1894-5; chief Liberal whip, 1899-1905; and home secretary, 1905-10. From 1910 to 1914 he was first gov.-gen. of new Commonwealth of South Africa, being raised to the peerage on his appointment.

GLADSTONE, WILLIAM EWART (1809-98), Brit. statesman; *b.* Liverpool; ed. Eton and Oxford, where he was prominent debater at Union at time of Reform Bill. His strong churchmanship made him look to Tory party for safety from revolutionary measures, and in 1839 he was described by Macauley as the 'rising hope of the stern unbending Tories.' He was M.P. for Newark, 1833; Junior Lord of Treasury under Peel, 1834; Under Colonial Sec., 1835. In Peel's second administration he became successively vice-pres. (1841) and pres. (1843) of Board of Trade; had considerable share in revising Customs tariff. Resigning office in 1845, G. was outside Parliament during great Corn Law movement, which, with Cobden's struggle for free trade, attracted his attention and probably initiated his gradual change from Toryism to Liberalism; M.P. for Oxford, 1847; first great speech delivered, 1852, in reply to scathing attack by Disraeli during debate on latter's Budget. Chancellor of Exchequer in 1853, he made first of his remarkable Budget speeches, and proved his financial genius; High Commissioner to Ionian Isles, 1859; again became Chancellor under Palmerston, 1859; abolished paper duty, 1861; became leader of Lower House, 1865; failed to carry Reform Bill, G. succeeded Lord Russell as Liberal leader in 1867; while in opposition carried bill for abolition of Church rates; became Prime Minister, 1868; disestablished Irish Church, 1869; passed Education and Irish Land Acts, 1870, and Ballot Act, 1872. In 1873 he failed to carry bill concerning Irish University Education, and in 1874 he dissolved Parliament and resigned Liberal leadership.

'Bulgarian Atrocities' in 1875 led him to attack Disraeli's foreign policy and defense of Turks. Again becoming Premier, 1880, he turned attention to Ireland, passed Coercion and Land Acts, 1881, Crimes Acts, 1882. Khartûm disaster of 1885 aroused hostility to government, on which votes of censure were moved by Opposition; defeated on Budget Bill, 1885, G.'s government resigned. He again became Premier, 1886; his introduction of Home Rule Bill caused split in Liberal party, and G. again resigned, and for six years remained in opposition, once more taking office as Premier in 1892; having failed to carry his Home Rule Bill in 1894, he retired to private life. One of the greatest of Parliamentary debaters, G. had great gift of eloquence, a genius for finance, a scholarly mind, and a deeply religious nature.

GLAIR, glazing preparation, made with white of egg and other ingredients, used in bookbinding.

GLAMIS (56° 37′ N.; 3° 1′ W.),

village, Scotland; castle associated with Shakespeare's *Macbeth*.

GLAMORGANSHIRE (51° 35′ N., 3° 30′ W.), most southerly county, Wales. Bounded N. by Brecknockshire, W. by Monmouth, S. by Bristol Channel, E. by Carmarthen. Area, 855 sq. miles. Most important county in Wales, owing to enormous mineral production. Chief towns include Cardiff, Swansea, Cowbridge, Merthyr-Tydvil, Neath, and Aberavon. Dairy-farming, fishing. Mining chief industry. Manufactured iron and steel-works. Among many fine ruined castles are those of Caerphilly, Castell Coch, Coity, Llantresant, Llanblethian, Newcastle, Swansea, and Pennard; castles of Cardiff, St. Donat's, St. Fagan's, Penrice, Dunraven, and Fonmon are restored. Pop. 1,253,000.

GLANDERS, contagious disease occurring in horses, asses, and mules, and communicable by them to man, caused by a bacillus, the *Bacillus mallei*; in man it usually starts at the hands or face, swellings appear which break down and ulcerate, accompanied by fever and a feeling of general pain.

GLANDS, in anatomy, a term originally applied to such bean-like structures as occur all over the body in connection with the lymphatic system; but the meaning has now been extended to embrace any group of secretory cells. Such structures separate from the blood the characteristic constituents of their various secretions, and in most cases they are arranged in the form of small sacs, with contracted necks or ducts, through which the secretions are poured. Some glands, however, such as the thyroid and the suprarenals, are ductless, and their elaborated products must be absorbed by the blood or by the lymph, for which reason they are sometimes called vascular. The liver is the largest glandular organ in the body, and weighs nearly four pounds. On the other hand, the peptic glands of the stomach are of microscopic dimensions, and consist of simple tubular recesses lined by a secreting cellular membrane, around which the blood circulates. The salivary, gastric, and intestinal glands secrete the various fluids necessary for the digestion of food; while the kidneys and sweat glands are excretory, and discharge waste products from the circulation. *Adenalgia* and *adenitis* are terms applied to pathological conditions of the glands—(*e.g.*,) pain and inflammation in them. The functions of the ductless or blood glands are imperfectly understood, but the thyroid secretion has a profound influence on the nutrition of the nervous system; while the spleen and lymphatics are largely concerned with the production of the cellular elements of the blood. Of late years extracts of various glandular tissues have been administered in cases of illness which appear to depend on defective gland secretion. The treatment has been a brilliant success in myxœdema and in cretinism, which result from disease of the thyroid gland. See DUCTLESS GLANDS; also ADRENOLS.

GLANVILL, RANULF DE (*d.* 1190), chief justiciary of England; author of the historically valuable legal work, *Tractatus de Legibus et Consuetudinibus Regni Angliae.*

GLARUS, GLARIS (47° 2′ N., 9° 4′ E.), canton, Switzerland, between Schwyz and St. Gall; surface almost entirely mountainous, rising in the Tödi to height of 11,887 ft.; traversed by Linth and affluents; joined Swiss Confederation, 1352. Capital, Glarus; textile manufactures. Pop. 1920, canton 33,834; town, 5089.

GLASGOW, city, the chief commercial and manufacturing center of Scotland (55° 51′ N., 4° 16′ W.), situated on both sides of river Clyde, some 22 m. from estuary, in co. of Lanark; second city in Brit. Isles; incorporated with Govan, Partick, Pollokshaws, and adjoining districts. Glasgow is a well-built town, masonry solid and substantial; older parts squalid, but newer districts pleasant; many streets are broad and open, the most important being Sauchiehall, Buchanan, Union, and Argyle streets. Of the many squares, most important are: Glasgow Green (in S.E.), with Nelson's Monument, People's Palace, museum, and art gallery; George Square, surrounded by handsome public and municipal buildings and statues. West End Park (crossed by Kelvin R.), contains Stewart Memorial and magnificent Corporation Art Galleries; others are Queen's Park, in S.W., and Alexandra Park. There are many handsome buildings, but the only one of any historical interest is the cathedral situated in N.E., built in Early Eng. Gothic style, and with beautiful crypt and stained-glass windows. Glasgow Univ. (now an imposing building on Gilmorehill) was founded *c.* 1451 by Bishop Turnbull. There are three terminal railway stations, and in every direction electric tramways extend long distances. Glasgow has made rapid strides in municipal enterprise; the town council owns the tramways, electric light, gas, and water-supply (brought from Loch Latrine).

Glasgow owes much of its prosperity and progress to its favorable position and proximity to rich fields of coal and ironstone. The harbor extends from Glasgow Bridge to junction of Kelvin and Clyde, and there are six miles of quays. Both banks of the Clyde are lined for many miles with shipbuilding yards and engineering works. Shipbuilding is the great industry—vessels of every type being built, from liners and battleships downwards. Iron-founding is an industry of vast importance; manufactures of steam tubes, boilers, locomotives, machinery, etc.; muslin and other textiles; chemical, paper, glass, and china works; spinning, dyeing, brewing, and many other industries. During the World War Glasgow and the neighborhood supplied enormous quantities of essential munitions of war to all branches of the forces.

Although only of much commercial importance since union of Scotland and England, Glasgow dates back to *c.* 560. Est. pop. with extensions, 1921, 1,034,069.

GLASGOW, ELLEN ANDERSON GHOLSON (1874), American novelist; *b.* at Richmond, Virginia, April 22, 1874. Educated privately. Among her novels are *The Descendant*, 1897; *Phases of an Inferior Planet*, 1898; *The Voice of the People*, 1900; *The Battleground*, 1903; *The Deliverance*, 1904; *Whirl of Life*, 1906; *The Ancient Law*, 1908; *Romance of a Plain Man*, 1909; *The Miller of Old Church*, 1913; *Life and Gabriella*, 1916; *The Builders*, 1917; *One Man in His Turn*, 1922.

GLASITES, SANDEMANIANS, Prot. sect, originated (1725) in Scotland by John Glas (*q.v.*); aimed at independent church government and simple doctrine.

GLASPELL, SUSAN (MRS. GEO. CRAM COOK) (1882); *b.* in Davenport, Iowa, July 1, 1882. Educated at Drake University, Iowa; postgraduate course at University of Chicago. Was for some time a journalist and later wrote stories and plays and was connected with the Provincetown Players. Author *The Glory of the Conquered*, 1909; *The Visioning*, 1911; *Lifted Masks*, 1912; *Fidelity*, 1915; *Trifles*, 1917; and with George Cram Cook, *Suppressed Desires*, 1917. Dramatic writings include *Berenice and Other Plays*, 1920; *Inheritors*, 1921.

GLASS is a complex solution of many substances, chiefly *silicates* and *borates*. Solidification occurs without any change in structure, and g. is often spoken of as a 'congealed liquid.' G. is a typical vitreous body with an amorphous structure. Although a large number of bodies can be obtained in the vitreous state, very few are used in g., because with many the cooling of the molten solution cannot be carried out quickly enough to avoid a component crystallizing out at its own freezing-point (*devitrification.*) Cost, as well as the risk of *devitrification* and the temperature of the furnaces, also restricts the choice of the substances used in g. manufacture.

Industrially, therefore, g. is composed of the mixed *silicates* of *bases*, those most in use being the *alkalies* (*Sodium* and *Potassium*), the *alkaline earths* (*Calcium*, *Magnesium*, *Strontium*, and *Barium*), and oxides of *Iron*, *Aluminum* and *Lead*. The properties of the g. depend on the base chosen, as does also its behavior during manufacture. *Lead* and *Barium* give weight and brilliancy, and increase the fusibility and softness during manufacture. *Magnesium* and *Aluminum* give a g. which stands red heat without softening. The *alkalies* increase the fusibility of g. and ensure its easy working, but reduce the chemical resistance of the finished article, which is hygroscopic and apt to decompose rapidly in a damp atmosphere. Even good g.—that is, g. containing less than 15 per cent. alkali—is not stable. The prolonged action of water on the best g. extracts a small quantity of alkali, and steam actively corrodes it. Water and alkali remove silica. Water and acid tend to protect g., since it prevents the formation of *silicon hydrate*, which permits the water to dissolve out the alkali. *Phosphoric* and *Hydrofluoric Acids* both corrode g.; the latter is used to etch g. *Carbonic Acid* in the presence of water dissolves the surface of g., rendering it liable to decomposition by bacteria. G. is photo-sensitive. Light produces color changes in it, bringing out a brown or purple tint in g. made with manganese. The *Tensile Strength* of g. is said to be about 2½ to 5 tons per sq. inch, and the *Crushing Strength* 3 to 8 tons per sq. inch. These two properties are both affected by rate of cooling. The hardness depends on the rate of cooling as well as on the constituents. G. is not a good conductor of heat, and the thicker it is, the more easily it is fractured, since the inner wall expands, while the outer wall, remaining stationary, suffers from this tension and fractures. This has to be overcome in the manufacture of boiler gauge glasses, glass and metal junctions, etc. The harder g. is, the better it acts as an electric insulator. Transparency is the most essential property of g., and it is estimated that over 90 per cent of it is used for this. Even the best g. absorbs a certain amount of light.

The manufacture of g. is controlled by the above facts. and the constituents, melting, and rate of cooling are so chosen as to adapt the g. as nearly as possible to the required object. The quality of the g. decreases with the impurities in the raw material; therefore, the raw material should be pure and uniform. The *silica* is got from sand, which must be dry and of uniform grain. For the best g. it must contain less than .05 per cent. of *Iron* and not more than .05 per cent. of other impurities. Sandstone is difficult to grind to uniform grain, and therefore cannot be used. Felspar is too expensive. The *alkali* used in the best g. is obtained from the *Le Blanc* or *Ammonia Soda* process, while *salt-cake* is used in the manufacture of inferior g. The *calcium* used in *sheet-g.*, *pressed* and *blown g.* is obtained as the carbonate or as slaked lime. The *Lead* for *flint g.* is introduced as *red lead.* For the special scientific, optical and technical glasses specially prepared salts of *Barium*, *Magnesium*, and *Zinc* are employed. *Aluminum* is added in the form of *felspar* or as *hydrate.* The *tanks* or *pots* used in the manufacture are made of *fire-clay* if they have to resist heat and the solvent action of g., or of *silica brick* if they have only the latter to withstand.

The furnaces are fed by gas generated in gas producers. In the furnace the gas meets with hot air and the mixture burns rapidly, and if properly proportioned gives very high temperatures. The materials are mixed very carefully, and when the mixture is uniform in color and material the heating commences. The *silica* is supposed to act as an acid; all the *carbon dioxide* is expelled, and *silicates* of *sodium* and *calcium* remain in combination and solution with one another, so that the contents of the furnace are a mass of transparent glass with many bubbles. The bubbles are disengaged by boiling, the g. then being '*fine.*' The surface is skimmed and the temperature reduced. The g. is now ready to be worked. If the g. is to be blown it is removed by *gathering.* A hot rod is dipped repeatedly into the mixture, and when some pounds have adhered the worker blows through the rod and a hollow sphere of g. is obtained. From this sphere articles are made by pressure, moulds or blocks with or without further blowing.

Stained Glass is an art of N. Europe which arose in the XII cent., and reached its turning point in Tudor times. The development of mosaics and frescoes on the wall of Ital. churches rendered it an unnecessary art in that country, consequently the finest examples are to be found in the older cathedrals and churches of France and England. The best work is now done, as it was in the Middle Ages, by the method known as 'mosaic glass.' First a design is prepared representing the figures in the proposed picture; then the glazier works out the main portions in various kinds of colored glass; after which the artist develops in pigment all the delicate shadings of draperies, the lines of the figures, etc., and when this is completed the colors are fixed by firing. 'Mosaic glass' may be distinguished by the characteristic way in which the leads, or *calms*, do not follow the outlines of the figures, but boldly intersect them, enclosing rich and variegated plots of color. An inferior method, known as 'enameled glass,' proceeds by painting entirely on white glass and fusing the pigments to fix them.

GLASS, CARTER (1858), United States Senator; *b.* in Lynchburg, Va. Educated at public and private schools, he was eight years in the printing trade and became owner of the Daily News and The Advance, morning and afternoon newspapers, respectively, of Lynchburg. He was a member of the Virginia Senate, 1899-1903; member of the State Constitutional Convention, 1901; of the 57th Congress, 1902-1903, to fill an unexpired term, and re-elected, 1903-1919, from the 6th Virginia Dist. Resigned in 1918, to be Secretary of the Treasury in Wilson's Cabinet, holding the office from December, 1918, to November, 1919. He was appointed to Congress to fill the unexpired term of T. S. Martin, deceased, and elected, 1919-1923.

GLASS, MONTAGUE (MARSDEN) (1877), author; *b.* in Manchester, England. In 1890 came to the United States. Educated at New York University and College of the City of New York. Author of *Potash and Perlmutter*, 1910; *Abe and Mawruss*, 1911; *Elkan Lubiner*, 1912; *Object; Matrimony*, 1912; *Competitive Nephew*, 1915; *Worrying Won't Win*, 1918; *Potash and Perlmutter Settle Things*, 1919. Plays: *Potash and Perlmutter*, 1913; *Abe and Mawruss*, 1915; *Business Before Pleasure*, 1917; *Why Worry?*, 1918; *His Honor Abe Potash*, 1919.

GLASSPORT, a borough of Pennsylvania, in Allegheny co. It is on the Pittsburgh and Lake Erie railroad, and on the Monongahela River. Surrounding it is an important coal mining region and its industries, which are important, include the manufacture of steel hoops, glass, foundry products, etc. Pop. 1920 6,959.

GLASTONBURY (51° 9′ N., 2° 33′ W.), municipal borough, Somersetshire, England. Tradition has it that Joseph of Arimathea brought here Holy Grail and founded first Christian Church in Britain. Abbey, erected VIII. cent., was destroyed by Danes and refounded by St. Dunstan, X. cent.; again destroyed, XII. cent., and rebuilt. Other notable buildings are tower on Tor-Hill, Pilgrims' Inn, XV. cent., Tribunal and Abbots Barn; quaint town, with many houses built of stones from cathedral. Manufactures include mats, gloves, pottery. Pop. 1921, 4,297.

GLATZ (50° 26′ N., 16° 39′ E.), fortified town, Silesia, Germany; machinery, textiles. Pop. 17,000.

GLAUBER'S SALTS, SODIUM SULPHATE ($Na_2SO_4, 10H_2O$), a transparent colorless, crystalline, prismatic substance, with a salt taste, obtained by the action of sulphuric acid on sodium chloride (common salt) and other sodium salts; first described by Johann Rudolf Glauber, 1603-68; it occurs native in parts of Spain, western N. America, and the Russ. Caucasus, as well as in certain mineral waters (Frederickshall) and sea-water. It is used medicinally as a purgative.

GLAUCHAU, town, Saxony, Germany; manufactures woolen materials, calicoes, and dyes. Pop. 25,000.

GLAUCONITE, green crystalline mineral occurring in mud on floor of ocean and in greensands, in some Tertiary rocks and Eocene sands, and largely in Lower Cretaceous rocks; is hydrous silicate of iron and potassium found generally in clusters of minute particles.

GLAUCUS (classical myth.).—(1) Son of Sisyphus, torn in pieces by his own horses; (2) Lycian prince, slain by Ajax in Trojan War; (3) *s.* of Minos, accidentally smothered in pot of honey, but miraculously restored to life; (4) fisherman of Anthedon (Bœotia), afterwards changed into a sea-god.

GLAZIER LAKE. A lake in Minnesota, south of Lake Itasca, into which it empties through a narrow stream. Area, 255 acres. Was named after Captain Willard Glazier, who claimed that it was the source of the Mississippi.

GLAZING, the craft of the skilled workman, known as a glazier, who fits panes of glass into window-sashes, doors, etc. Besides various measuring and other tools, including the diamond, for cutting purposes, putty-knife, etc., the chief materials used in fixing the glass are putty, or beading. Sometimes a bed of rubber or other material is used instead of putty.

GLEANING, or **LEASING**, the ancient custom which permits the poor to gather up the leavings of the harvest after the reaper has finished his work. The grant of this right was commanded in the Mosaic law (Lev. XIX. 9, 10), and in this country came, by long usage and tradition, to be regarded almost as a legal obligation.

GLEASON, ELLIOTT PERRY (1821-1901), American inventor; *b.* in Westmoreland, N. H; *d.* in New York. He received only a common school education and turned his attention to inventions, especially of gas lights. He devised different gas burners, the most notable being the argand with a switch to control the flame.

GLEAVES, ALBERT (1858), American naval officer; *b.* in Nashville, Tenn. Graduated from the U. S. Naval Academy in 1881. He rose to be a captain in 1909, rear-admiral in 1915, vice-admiral in 1918 and admiral in September, 1919. He commanded the torpedo boat Cushing in the Spanish War, the U. S. S. St. Louis, 1908-1909; U. S. S. North Dakota, 1910-1911. Naval Station Narraghansett, 1911-1912; and at New York, 1912-1914; U. S. S. Utah, 1914-1915, and destroyer force, Atlantic Fleet, 1915-1917. Convoyed first A. E. F. to France in June, 1917. Commander of Atlantic transportation, July, 1917, to September, 1919. Asiatic Station, 1919-1921; 1st Naval Dist. and Navy Yard, 1921; retired in 1922.

GLEBE, in England, land pertaining to an ecclesiastical benefice, from which the incumbent derives his income.

GLEE, an unaccompanied vocal composition for three or more voices; in vogue at the beginning of XVIII. cent.

GLEIG, GEORGE (1753-1840), Scot. episcopalian bp. of Brechin, 1808; primus of Scotland, 1816; a zealous and reforming prelate.

GLEIWITZ (50° 17′ N., 18° 40′ E.), town, Pruss. Silesia, Germany; iron foundries; glass-works. Pop. 1919, 69,028.

GLEN GREY (31° 30′ S., 27° E.), division of Cape province, S. Africa; native land settlement. Pop. 51,000.

GLENALMOND (56° 27′ N., 3° 50′ W.), village, Perthshire, Scotland; seat of Trinity Coll. (Episcopal).

GLENCAIRN, EARLS OF.—William,

4th earl, supported Henry VIII.'s Scot. policy. Alexander, 5th earl, supported Reformation. William, 9th earl, aided Charles II.; Chancellor of Scotland, 1660. James, 14th earl, befriended Burns.

GLENCOE—(1) (56° 38′ N.; 4° 57′ W.), deep valley, N. Argyllshire, Scotland; scene of massacre of the MacDonalds, Feb., 1692. (2) town, Natal, S. Africa.

GLEN COVE, a city of New York, in Nassau co. It is on the Long Island railroad, and on Long Island Sound. It is chiefly a residential community for New York City, and has many handsome private residences. There is an excellent school system and a public library. Here is a Friend's academy. Pop. 1920, 8,664.

GLENDALE, a city of California, in Los Angeles co. It is on the San Pedro, Los Angeles, and Salt Lake railroads, and on the Pacific Electric line. It is chiefly a residential city and has a sanitarium, a public library and a high school. It is the center of an important fruit growing area. Pop. 1920, 13,536.

GLENDOWER, OWEN (*c.* 1359-1415), Welsh hero who opposed Henry IV., calling himself Prince of Wales; carried on harassing border warfare till 1403, when he joined the Percies, who were also in rebellion; defeated in 1405 by Prince Henry, whose capture of Harlech in 1409 ended war.

GLENLIVET, Scot. valley, Banffshire; scene of Prot. victory, 1574; famous manufacture, whisky.

GLENN, EDWIN FORBES (1857), army officer; *b.* in North Carolina. Educated at Lenoir School for Boys. Dr. Simons' Preparatory School. In 1877 was graduated from United States Military Academy. Bachelor of Law, 1890, of University of Minnesota. In 1914 a graduate of War College, Washington. Appointed a second lieutenant in U. S. Army in 1877, and was promoted through the various grades to major, 1917. From August, 1917, to January, 1918, organized Camp Sherman, Ohio, and 83rd Division. At Camp Sherman, February, 1919, commander demobilization. Retired at own request in 1919. Commander of Legion of Honor, France. Author of *Glenn's International Law*, 1895.

GLENN, JOHN MARK (1858), general director, Russell Sage Foundation; *b.* in Maryland. Educated at Washington and Lee University, degree of Master of Arts, 1879. At Johns Hopkins, 1879-1880. Bachelor of Arts, University of Maryland, 1882. Admitted to bar in 1882. Since 1907 has been general director of Russell Sage Foundation. President of National Conference Charities and Corrections, 1901. Was member executive committee and social service commission, Federal Council of Churches. Member of Department of Christian Social Service, Protestant Episcopal Church.

GLENNON, JAMES HENRY (1857), American naval officer; *b.* in French Gulch, Cal. Graduating from the U. S. Naval Academy in 1878, he was captain in 1909; rear-admiral, 1916. Naval representative, U. S. special mission to Russia, 1917; commander Squadron I. Atlantic fleet, September, 1917; 5th Division Atlantic fleet, 1918; commander 13th Naval Dist., 1918-1919; 3rd Dist., 1919; retired, February 11, 1921.

GLENNON, JOHN JOSEPH (1862), American Catholic Archbishop; *b.* in Kinnegal, Westmeath, Ireland. Educated at Mullingar and All Hallows, Dublin; ordained priest, 1884; assistant pastor at St. Patrick's, Kansas City, Mo., in 1887; and pastor of the cathedral there, 1887-1902. He was vicar-general of the diocese, 1892-1894; coadjutor bishop of Kansas City and titular bishop of Pinara, June, 1896; coadjutor archbishop of St. Louis, April, 1903, and in October, archbishop.

GLENROY, Scot. valley, Inverness-shire; famous for three superimposed natural terraces, *parallel roads*, supposed shorelines of ancient lakes, different levels.

GLENS FALLS, a village of New York, in Warren co. It is on the Delaware and Hudson railroad, and on the Hudson River, 54 miles north of Albany. The river here flows through a ravine and descends 50 feet over a precipice 900 feet long. From this the village derives its name. The river furnishes immense water power, which is used in the extensive industries, which include lime works, saw mills, shirt, paper, and collar factories, and planing mills. There is a high school, public library, a summer school for teachers, and Glen Falls Academy. Pop. 1920, 16,638.

GLINKA, MICHAEL IVANOVICH (1803-57), Russ. composer; laid foundation of modern Russ. music; composed *A Life for the Tsar*, national opera.

GLOBE, a city of Arizona, in Gila Co. It is on the Arizona Eastern railroad. The country surrounding it is one of the most important copper regions of the United States, and Globe has large

smelting works and other plants for the preparation of copper. In the neighborhood is the great Roosevelt dam, which was erected at a cost of over $8,000,000. There is a public library and other public buildings. Pop. 1920, 7,044.

GLOBE-FISHES, PUFFERS (*Tetraodontidae*), prickly skinned, bony fishes which are capable of inflating their body to a globe shape; mostly inhabitants of tropical and temperate seas, though a few occur in large rivers.

GLOBES. Ordinary globes are made by pasting sheets of paper over a spherical core until a sufficient thickness is attained. This shell is then cut into hemispheres, removed from the core, and glued together round a metallic axis. It is then covered with a mixture of whiting, boiled oil, and glue, and reduced to a perfect spherical surface by a semicircular arc of steel rotated round the poles. A metallic meridian, attached to the poles of the axis and graduated from the equator to the poles, surrounds the globe, and can slide through grooves in a graduated horizontal circle. The first globes constructed were astronomical, the oldest extant being preserved at Naples. The oldest terrestrial globe, showing the knowledge of the world immediately before the voyages of Columbus, was made by Martin Behaim of Nuremberg, 1492; Lenox globe in New York, engraved on copper, is the first post-Columbian globe, 1510-12.

GLOGAU (51° 40′ N., 16° 3′ E.), fortified town, Germany, on Oder, Pruss. Silesia; center of wool trade; various manufactures. Pop. 24,000.

GLORIA, GLORY, first word of doxology, 'Glory be to the Father,' etc., *Gloria in exelsis* (Glory be to God on High).

GLOSS (from Gk. *glossa*, 'language'). —The word 'gloss' means a comment or explanation of a word or passage, the writer of which is called a 'glossator;' '*glossary*' is a tabulated list of words requiring special explanation, and the maker is known as a 'glossarist.' During the Alexandrian period the glossing of the early Gk. poets became common, and amongst the notable writers engaged in the work were Philetus of Cos, Aristophanes of Byzantium, Apion, Suidas. Two famous glosses on the Lat. Vulgate are Walafrid Strabo's *Glossa Ordinaria* (IX. cent.) and the *Glossa Interlinearis* of Anselm of Laon (*c.* 1100). At a later period the glossing of works on civil and canon law was eagerly taken up by scholars, a notable example of the kind being *Corpus Juris Glossatum*, of a XIII.-cent. writer, Accursius. Subsequently the making of glosses upon a great variety of works became widespread amongst all cultured peoples. Tyrwhitt's *Glossary to Chaucer*, 1775, may be referred to as an example of many modern works of the kind.

GLOSSOP (53° 27′ N., 1° 58′ W.), market town, Derbyshire, England; cotton manufactures. Pop. 1921, 20,528.

GLOTTIS. See LARYNX.

GLOUCESTER.— (51° 52′ N., 2° 15′ W.), city, capital of Gloucestershire, England; parliamentary and county borough and port, on Severn. Ancient historic town with beautiful cathedral, once Benedictine abbey; architecture chiefly Norman and Perpendicular; central tower, whispering gallery, and cloisters are particularly fine. Among other buildings are New Episcopal Palace, West Gate, XII. cent., New Inn, *c.* 1450, and Guildhall Connected with Sharpness by G. and Berkeley Canal. Shipbuilding, foundries, chemical works. Pop. 1921, 51,330.

GLOUCESTER, a city of Massachusetts, in Essex co. It is on the Boston and Maine railroad, and on Massachusetts Bay, near the extremity of Cape Ann, 32 miles northeast of Boston. From its earliest days Gloucester has been one of the most important fishing centers of the United States. Over 5,000 men are engaged in fisheries, which include cod, halibut, herring, and mackerel. In the neighborhood are large granite quarries which have supplied granite for many large public buildings and for the East River Bridge in New York City. Gloucester is a popular summer resort. It also has much historical interest. It was founded in 1623 by settlers from Gloucester, England, and was incorporated as a town in 1642. In 1874 it became a city. It has a public library, Gilbert Home, Huntress Home for Aged Women, a high school, and other public buildings. Pop. 1920, 22,947.

GLOUCESTER CITY, a city of New Jersey, in Camden co. It is on the Atlantic City, and Pennsylvania railroads and on the Delaware River, 3 miles south of Camden. It is connected by steam ferry with Philadelphia. Its industries include cotton mills, iron works, print works, and the plant of the Welsbach Gas Mantle Company, and other manufacturing establishments. It has also important fishing interests. Pop. 1920, 12,162.

GLOUCESTER, GILBERT DE CLARE, EARL OF (1243-95), Eng.

soldier; prominent figure in the baronial wars of Henry III.'s time, and instrumental in securing the accession of Edward I., 1272.

GLOUCESTER, HUMPHREY, DUKE OF (1391-1447), Eng. soldier; *s.* of Henry IV. and Mary de Bohun; present at Agincourt, 1415; acted as regent during Henry V.'s absence in France, 1421, 1422; Protector during Henry VI.'s minority.

GLOUCESTER, RICHARD DE CLARE, EARL OF (1222-62), Eng. soldier; the most powerful peer of his day, and leader of the barons in their rising against Henry III.

GLOUCESTER, ROBERT, 1ST EARL OF (*d.* 1147), Eng. soldier; illegitimate *s.* of Henry I.; fought for Matilda against Stephen; won battle of Lincoln, 1141.

GLOUCESTER, THOMAS OF WOODSTOCK, 1ST DUKE OF (1355-97), Eng. statesman; *s.* of Edward III.; practically ruled England, 1386-89; arrested on charge of plotting against Richard II., 1397; soon afterwards died, or was killed, at Calais.

GLOUCESTERSHIRE (51° 45′ N., 2° 30′ W.), W. midland county, England, situated on estuary and lower course of Severn. Bounded N. by Herefordshire, Worcestershire, and Warwickshire, E. by Oxfordshire, S. by Berkshire, Wiltshire, Somerset, W. by estuary of Severn and Monmouthshire. Area, 1,228 sq. miles. Chief towns: Gloucester (capital), Cheltenham, Tewkesbury, and part of Bristol. Surface is varied, with three distinct features: E., Cotswold Hills (highest, Cleeve Hill); center, rich fertile valleys of Severn and other rivers; W., Forest of Dean. Most important rivers include Avon, Lower Avon, Wye, and Thames. Sheep-farming is carried on in hills; in valleys pastureland, orchards, woods, and dairy-farms where celebrated G. cheese is made. W. are coal-fields of Forest of Dean and Bristol. Other minerals include iron, ochre, building-stone, freestone, and quartz. Manufactures—woolens, cottons, silk, gloves, glass, hardware. Extensive canal system. Most noteworthy antiquities are: cath's of G. and Bristol; churches of Tewkesbury and Cirencester; many fine parish churches; remains of Hayles Abbey and castles of Berkeley, Thornbury, and Sudeley. Pop. 1921, 757,668.

GLOVE, covering for the hand, usually made of fine dressed skins, silk, wool, or cotton. 'Kid' gloves, made from kid or sheep-skin, are largely made in Paris and other Fr. towns. The most delicate kinds are usually described as suede, in which the inner side of the skin is dressed; and glace, the outer side. As regards the history of g's they appear to have been used from very early times, and are referred to in Homer's *Odyssey*. They probably reached their most decorative stage, in England, in the reign of Elizabeth, when they were often jeweled and otherwise ornamented. In mediæval times the throwing down of a glove was a symbol of defiance.

GLOVER, SIR JOHN HAWLEY (1829-85), Brit. administrator; was administrator of Lagos; served in the Ashanti War (1873); afterwards gov. of Newfoundland, and subsequently of Leeward Islands.

GLOVER, RICHARD (1712-85), Eng. poet; wrote two epics; *Leonidas* and *The Athenaid*; also two tragedies; best remembered by his ballad, *Hosier's Ghost*.

GLOVERSVILLE, a city of New York, in Fulton co. It is on the Fonda, Johnstown and Gloversville railroad, and on the Erie Canal, 50 miles northwest of Albany. Its chief industry is the manufacture of gloves, in which it takes preeminence. Here is the Nathan Littauer Hospital, the Parsons Free Library, a high school, and business college. Pop. 1920, 22,075.

GLOW-WORMS, see under POLYMORPHA.

GLOXINIA, genus of tropical, gesneriaceous herbs; violet flowers; also greenhouse plant, genus *Sinningia*, especially *S. speciosa*.

GLUCK, ALMA (RIEBA FISON) (1886), American soprano; *b.* in Bucharest, Rumania, in 1886. She came to America in 1889 and was educated at the Normal College, New York and Union College, Schenectady. Studied voice under Signor Buzzi Peccia, and made her first operatic appearance in the *Werther* in 1909. She married Efraim Zimbalist in 1914.

GLUCK, CHRISTOPH WILLIBALD, or RITTER VON GLUCK (1714-87), Ger. composer; *b.* near Neumarkt; studied at Vienna and Milan, where first opera, *Artaserse*, was presented (1741), followed by *Demofoon*, *Artamene*, *Poro*, and others belonging to old school of Ital. opera; visited England, 1745; greatly impressed by Händel's works, and later in Paris by Rameau's operas; settled in Vienna, 1756. Between 1762 and 1769 G. produced first great operas of new type: *Orpheus and Euridice*, *Alceste* (with explanatory prefaces), and *Paris and Helena*; visited

Paris, and successfully brought out a music drama, *Iphigenie en Aulide*, 1774, and *Armide*, 1777. His great work, *Iphigenie en Pauride*, 1779, secured him complete and permanent victory over Ital. rival, Piccini; returned to Vienna, 1780.

GLUCOSE. $C_6H_{12}O_6$. Also known as dextrose and grape sugar. The most important member of the group of sugars known as *monoses*. It is found in large quantities in grapes and the hard nodules found in raisins (dried grapes) consist of this sugar deposited from the juice, in which it occurs in solution. It is also found in many other sweet fruits and in the roots, stems and leaves of plants, usually associated with fructose. It may be prepared from cane sugar by boiling with dilute acids, when a mixture of fructose and glucose, known as invert syrup, is produced. To obtain the glucose in a pure condition the process of inversion is carried out in acidified 90% alcohol. After addition of the cane sugar the mixture is kept at a temperature of 50° C for two hours, when it is allowed to cool. The glucose crystallizes out, the more soluble fructose remaining in solution. Anhydrous glucose melts at 146° C, but crystalline glucose, containing one molecule of water, melts at 86°C. It is much less sweet then cane sugar, is soluble in its own weight of water at room temperature, and is a strong reducing agent. It ferments readily with yeast, yielding alcohol and carbon dioxide, and small quantities of fusel-oil, glycerine and other substances. Solutions of the sugar rotate the plane of polarization of polarized light to the right. Hence the name *dextrose* (*q.v.*). With certain metallic hydroxides, notably calcium and barium, glucose forms *glucosates*, compounds soluble in water and readily decomposed by carbonic acid with regeneration of glucose.

GLUCOSIDES are substances yielding sugar, especially *glucose*, on fermentation or *hydrolysis*. For each group there is a special ferment. They are classified by the chemical constitution of the non-glucose part of the molecule into (1) *Ethylene Derivatives* (mustard oils), decomposed by ferment *myrosin*. (2) *Benzene Derivatives* (salicin), decomposed by *ptyalin* and *emulsin*. (3) *Styrolene* and *Anthracene Derivatives*.

GLUE is an impure gelatin with strong adhesive properties.—Bone Glue is made by dissolving grease out of bones by *petroleum*. The *de-greased* bones are then steamed under pressure in cylinders with false bottoms. The glue-liquor collects below the false bottom, is clarified with alum, and concentrated in *vacuo* to 30% dry glue. The liquor, bleached by *sulphur dioxide*, is allowed to cool to a jelly.—Fish Glue has a disagreeable odor. Glue should be free from grit, and of uniform golden color. Cold water should soften and swell it and hot water dissolve it.

GLUKHOV (51° 42′ N., 33° 54′ E.), town, Chernigov, S.W. Russia; kaolin mining. Pop. 15,000.

GLUTEN, adhesive substance derived from kneading wheat flour in water; composed of fibrin and gelatin; highly nutritious; best wheaten flour should contain 11% gluten. Word also used generally of gum.

GLYCERIN, GLYCEROL, GLYCERINUM ($C_3H_5(OH)_3$), colorless, viscid liquid, with a sweetish taste; Sp. G., 1.265; when heated it decomposes, and it dissolves readily in water and alcohol. It is obtained from the action of alkalies or superheated steam on fats and fixed oils, and commercially it is mainly obtained from the spent lyes in soap-making. It is used as a lubricating agent in the manufacture of nitro-glycerin; in the making of plasters, modeling clay, moist colors; as a preservative and slight antiseptic; as a solvent for coloring fluids and various drugs, (*e.g.*) iodine, tannic acid alkalies, alkaloids, and neutral salts; and medicinally as a purgative.

GLYCOGEN ($C_6H_{10}O_5$), a carbohydrate, white, amorphous powder, found in liver; turns red with iodine.

GLYCONIC VERSE, metres used by Gk. lyric poet Glycon; logaœdic tripody or tetrapody, (*i.e.*) a spondee and two dactyls, three trochees and a dactyl, or dactyl and three trochees.

GLYN, ELINOR (MRS. CLAYTON), a British novelist and writer. Publications: *The Visits of Elizabeth*, 1900; *Reflections of Ambrosine*, 1902; *Beyond the Rocks*, 1906; *Three Weeks*, 1907; *Elizabeth Visits America*, 1909; *His Hour*, 1910; *The Reason Why*, 1911; *Letters to Caroline*, 1914; *Three Things*, 1915; *The Career of Katherine Bush*, 1916; *Six Days*, 1922.

GMELIN, the name of a distinguished family of German scientists:

Johann Georg Gmelin (1709-55), a German scientist and traveler, born in Tübingen. In 1731 he was made professor of natural chemistry and history at St. Petersburg, and in 1733 he undertook a journey to Siberia. In 1749 he was appointed professor of botany and chemistry at Tübingen. He

published *Flora Sibirica*, 1747-49, and *Reise durch Sibirien* between 1751-52.

Leopold Gmelin (1788-1853), a German chemist, son of Johann Friedrich, born at Göttingen. He studied medicine at Göttingen and Tübingen, and taught chemistry at Heidelberg for four years, after which he was made professor of medicine and chemistry at Heidelberg, 1817-51. He wrote many scientific works, amongst which is *Handbuch der Chemie*, 1817-19; this was translated into English, 1848.

GLYPTOSAURUS, a fossil land lizard, the remains of which were found in 1871 in Wyoming. It is so called from the fact that the head and parts of the body were covered with bony plates. Several species have been discovered, the largest being about four feet in length.

GMÜND (48° 48′ N., 9° 48′ E.), town, Württemberg, Germany; gold and silver jewelry. Pop. 1919, 20,294.

GNAT, a genus of small dipterous flies of the family of *Culicidae*, very common in a fen or marshy district. There are nine British species, the *Culex pipiens* being the common G. Mosquitoes are included in the family, but are larger in size and bite more effectively.

GNEISENAU, Ger. cruiser (11,420 tons, 23.5 knots, eight 8-2-in. guns, completed 1908), belonged to the Pacific squadron under von Spee at outbreak of the World War; fought in battle of Coronel, Nov. 1, 1914, and was sunk in battle of Falkland Islands, Dec. 8.

GNEISENAU, AUGUST WILHELM ANTON, COUNT NEITHARDT VON (1760-1831), Prussian soldier; served in Amer. War of Independence, on Brit. side; present at Jena; defended Kolberg, 1807; became Blücher's chief of staff; distinguished in Waterloo campaign; gov. of Berlin, 1818; Field-Marshal, 1825.

GNEISS, mineral; name originally used by miners of the Hartz, but now used by geologists to describe certain metamorphic rocks composed generally of layers of quartz and felspar. Some g's are sedimentary, others igneous and differ from granite only by their foliated structure; contain no fossil remains; there are several varieties classed generally according to the distinct minerals they contain; they include muscovite-g., biotite-g., muscovite-biotite-g., mica-g., and syenitic-g. (containing hornblende).

GNESEN (52° 32′ N., 17° 33′ E.), town, Posen, Germany; old crowning-place of Polish kings. Pop. 25,000.

GNOMES, legendary dwarfs, dwelling in the earth, and supposed to guard its treasures.

GNOMIC POEMS, versified maxims (*Gnomes*), much favored by the ancient Gk. poets.

GNOSTICISM, a name used to embrace a number of sects on the borderland between Christianity and heathen thought. Its root principle was not faith but knowledge (*gnosis*), which was given to the initiated only. In its speculations it mixed up the Platonic theory of ideas (that everything has a spiritual arche-type) with an Oriental dualism which made all matter evil. The supreme God was removed from the world and could only communicate with it by a number of æons, in which various principles and ideas were personified.

G. was antagonistic to Judaism, for it held the God of the O. T. to be the *Demiurge*, a secondary God. The opposition of spirit and matter is a Gr. idea, but into this is united the idea of a conflict in the present world between forces of good and evil, which is Zoroastrian. Gnosticism was essentially mystical and also sacramental; many sacraments analogous to Christian rites were invented. Like other heretics, Gnostics were charged with immorality, and not without cause, as they tended to oscillate between asceticism and licentiousness. Christianity prevailed against the movement, as it also did against the Ebionites, some of whom leaned to Gnosticism.

GNU, OR WILDEBEESTE, name given to two species of antelope (genus *Connochaetes*), differing widely from all others in appearance, having heavy, bull-like head and shoulders, and a tail like that of a horse; horns are present in both sexes. Gnus are gregarious, swift of foot, and dangerous when brought to bay; are frequently seen in zoological collections.

GOA (15° 20′ N., 74° E.), Portug. territory on W. coast of India, S. of Bombay; extends 60 miles along Ind. Ocean; area, c. 1,400 sq. miles; immense forests and many rivers; chief exports—salt, spices, fruit, coconuts, copra, manganese, and iron. *Old G.* former flourishing capital, with remaining fine archiepiscopal cathedral and church of Bom Jesus. Numerous palaces and splendid churches in ruins. *Nova G.*, or *Panjim*, present capital, on Mandavi, with viceregal palace, barracks, technical school, harbor, 1882, etc. Taken from Mohammedans by Albuquerque, 1510; Old G. was made capital and rose to great commercial prosperity under Portuguese. Administered by gov.-gen. Pop. 520,000.

GOALPARA (26° 11′ N., 90° 41′ E.), district, Assam, India; fertile, chief crop, rice; exports timber, cotton; subject to earthquakes; unhealthy climate. Area, 3,961 sq. miles. Pop. 462,000. Capital, Goalpara, on Brahmaputra. Pop. 6,000.

GOAT (connected with Lat. *haedus*, a kid). G's. are a genus of ruminant quadrupeds, forming, with sheep, the 'caprine' (Lat. *caper*, goat) section of the Bovidæ family. They are very closely allied to sheep, but distinguished by horns in both sexes (usually more pronounced in the male). These horns are generally long, and directed upward, outward, and backward, while those of sheep are shorter and mostly spirally twisted. Male G's. have beards, and a strong, offensive smell, especially during the rutting season. G's. have shorter tails than sheep, and are marked by the absence of the small pit between the toes of the hind-feet. In habits they are much bolder and more curious than sheep, and do not blindly follow the flock. (The term 'capricious' is derived from G.'s.) Two species exist in N. Africa, and one in S. India, but they are not commonly found below the Himalayas. The domestic G. is very common in the United States, and is greatly valued for its milk, which is especially suited for children and invalids. There are numerous varieties of the wild G. (*Capra hircus*), including the ibex of the Alps, Himalayas, and Arabia; the Bezoar G. or Paseng (pasang), probably the parent of the common domestic G.; The Tur of the Caucasus; the Markhor of the Himalayas; the Spanish G.; and the Thar or Goat-antelope (*Hemiragus*), and the Rocky Mountain G. in the United States. G.'s hides make good leather, and are sometimes used for kid gloves. Of the domesticated breeds the most famous are the Angora and the Kashmir. The former have long, silky hair next to the skin, and an outer covering much resembling wool. The latter have a coat of woolly texture next the skin, and the long, silky hair-covering outside. From this are made the true Kashmir or 'camel's hair' shawls. The two chief varieties of Kashmir G's. (var. *laniger*) are the 'chappoo,' and the more common 'changra.' They abound chiefly in Tibet and Bokhara. The Angora breed has been introduced into Cape Colony (*c.* 1864), Australia, and U. S. A.

GOAT ISLAND, a small island about 70 acres in area, which divides the current of the Niagara Falls. It is connected by a bridge with the American side of the falls.

GOATSBEARD, popular name of cichoriaceous plant, genus *Tragspogon*, order *Compositae*; also fungus of genus *Clavaria*.

GOATSUCKER, OR NIGHTJAR, is a bird of nocturnal habits, feeding on insects which it captures on the wing; beak short and broad, and mouth enormously wide, and fringed with highly modified, bristle-like feathers.

GOBELIN, a famous make of tapestries produced at a factory in Paris. The founder of the firm was Giles G., a XVI.-cent. wool-dyer.

GOBI (*c.* 43° N., 110° E.), Chin. name for extent of desert stretching from Pamirs to Great Kingan Mts. on borders of Manchuria, and from Altai, Sayan, and Yabloni Mts. on N. to most northerly ranges of Kuenlun Mts. on S.; includes large portion of Mongolia; 450 to 600 miles from N. to S., and over 1000 miles from S.W. to N.E.; elevation between 3000 and 5000 ft. and sometimes higher; also called Shamo (sandy desert), and Han-Hai (dry sea). Almost whole surface is sandy or stony desert, without water or vegetation (except for oases) and with little animal life; in some parts are grassy steppes, masses of rocks and crags, and salt lakes. Mountainous tracts, forests, good water, abundant vegetation, and more animal life are to be found in part known as Ordos. Climate has great extremes, with rapid changes. Shifting sands have buried large extents of once cultivated country and habitations, and many discoveries of buried towns and villages have been made; important explorations have been made by Przhevalsky, Sven Hedin, and others. Desert crossed by various caravan routes, some being thousands of years old; among principal routes are those leading from Kalgan (on Chinese frontier) to Urga, from Su-Chow to Hami, and from Hami to Peking. An American expedition headed by Roy E. Andrews, explored the region in 1922-23.

GOBLET (Fr. *gobelet*), large drinking-cup, on stem, but without handles.

GOBLET, RENÉ (1828-1905), leader of Fr. Radical party; prime minister at close of 1886; unequal to facing Boulanger, and resigned, 1887.

GOCH (51° 40′ N., 6° 10′ E.), town on Niers, Rhine province, Prussia; various small manufactures. Pop. 11,000.

GOD (O.E. *god*, Dutch *god*, Ger. *gott*), in heathen times an idol, or object of

worship. Since the Teutonic acceptation of Christianity it is the name reserved to the Creator of the Universe. See THEISM.

GOD, CHURCHES OF. See CHURCHES OF GOD.

GODALMING (51° 11′ N., 0° 37′ W.), market town, on Wey, Surrey, England; seat of Charterhouse School. Pop. 1921 9,193.

GODAVARI (16° 30′ N., 82° 15′ E.), river, in Deccan, Brit. India; flows S.E.; discharges by seven mouths into Bay of Bengal; length, *c.* 900 miles; one of the twelve sacred rivers of India.

GODAVARI (17° N., 81° E.), district, Madras Presidency, Brit. India, in lower valley of Godavari; chief town, Cocanada. Area, 5634 sq. miles. Pop. 1,500,000.

GODEFROY, DENIS (1549-1622), member of notable Fr. family; prof. of Law at Geneva; was historiographer of France. Jacques G. (1587-1652) pub. new edit. of *Codex Theodosianus*. Théodore G. (1580-1649) wrote *Le Ceremonial de France*.

GODESBERG (50° 41′ N., 7° 9′ E.), town, summer resort, Rhine province, Prussia; mineral springs. Pop. 15,000.

GODFREY, EDWARD SETTLE (1843), an American soldier; *b.* in Kalida, Ohio. Without finishing his education he enlisted as a private in the Union Army at the beginning of the Civil War, but afterwards entered the West Point Military Academy and graduated in 1867. He served through the Indian wars in the West and in Cuba during the Spanish-American War, retiring in 1907 with the rank of brigadier-general. An article which he wrote in the Century Magazine, *General Custer's Last Battle*, is one of the most valuable personal records of Custer's death.

GODFREY, HOLLIS (1874), an American engineer and writer; *b.* in Lynn, Mass. He graduated from Tufts College, in 1895, and was engaged in teaching, writing and engineering from 1898 to 1905. He has been consulting engineer to the cities of Philadelphia, and Atlantic City and private corporations. Since 1913 he has been president of the Drexel Institute, in Philadelphia. Many of his articles have appeared in Collier's Weekly, the Review of Reviews, the Atlantic Monthly and numerous technical journals. Among his books are *The Man Who Ended War*, 1908; *The Health of the City*, 1910; *Jack Collerton's Engine*, 1911; and *Dave Morrell's Battery*, 1912.

GODFREY OF BOUILLON (*c.* 1060-1100), Fr. crusader; led army in first crusade, 1096; took Antioch, 1097, Jerusalem, 1099; became ruler of Jerusalem, with title, 'Defender and Guardian of Holy Sepulchre'; great victory over Moslems at Ascalon, 1099, made him supreme in Palestine.

GODFREY OF STRASBURG (1200), a German poet, who lived in Strasburg. He was the author of many lays but is especially known for his great poem, *Tristan und Isolde*, taken from the legend of the Round Table.

GODFREY OF VITERBO (fl. XII. cent.), author of *Memoria seculorum*, of which part entitled *Gesta Friderici* is important source for career of Emperor Frederick I.

GODIN, JEAN BAPTISTE ANDRÉ (1817-88), Fr. socialist; author of *Solutions Sociales*, 1871; *Mutualite Sociale*, and similar works.

GODIVA (XI. cent.), wife of Leofric, Earl of Mercia, who, at her husband's challenge, rode naked through the streets of Coventry, to secure the relief of the townspeople from the heavy taxation which the earl had imposed; subject to poem by Tennyson. Each year a pageant celebrating the devotion of Godiva is held in Coventry.

GODKIN, EDWIN LAWRENCE (1831-1901), an Irish-American editor; *b.* in Mayne, Ireland. He was educated at Queens College, Belfast, and during the Crimean War represented the London Daily News at the front. In 1858 he came to the United States as a newspaper correspondent, where he studied law, being admitted to the New York bar, but on the outbreak of the Civil War he went to the front as correspondent for English and American papers. After the war he returned to New York where, in 1865, he founded *The Nation*, and when that paper was merged in a joint ownership with the New York Evening Post, he remained editor of both papers till his death. He wrote *A History of Hungary*, 1856; *The Problems of Modern Democracy* and *Reflections and Comments*.

GODOLPHIN, SIDNEY, EARL OF G. (*c.* 1645-1712), Eng. politician; page in Charles II.'s household after Restoration; P.C. and Lord of Treasury, 1619; First Lord of Treasury under Charles II., James II., William III., and Anne; promoted Anglo-Scot. Union; dismissed from office, 1710.

GODOWSKY, LEOPOLD (1870), pianist; *b.* in Wilna, Russia. Educated at Berlin Hochschule, 1884 and studied with Saint-Saens, Paris. At age of nine made his first public appearance. Toured Poland, Russia and Germany. 1884-1886 appeared in America. 1895-1900 director of piano at Chicago Conservatory of Music. In 1909 appointed by Austrian Emperor, director Imperial Royal Meisterschule for Piano at Imperial Royal Academy of Music, Vienna, 1912 editor-in-chief of Art Publication Society, St. Louis. Composed pieces for pianos and violins.

GODOY, MANUEL DE (1767-1851), Duke of El Alcudia; Span. courtier and statesman; prime minister, 1792-98; negotiated Treaty of Basel; became Prince of the Peace, 1795.

GODRA, GODHRA (22° 46′ N., 73° 40′ E.), town, Bombay, India; trade in timber. Pop. 21,000.

GODWIN, FRANCIS (1562-1633), Eng. ecclesiastic; bp. of Hereford (1617); author of *Annales of England*, 1630; and a fantastical story, *The Man in the Moon*, first pub. 1638.

GODWIN, MARY WOLLSTONECRAFT (1759-97), Eng. writer. Her works include *Vindication of the Rights of Women* and *Original Stories for Children*.

GODWIN, PARKE (1816-1904), an American editor and writer; *b.* in Paterson, N. J. He graduated from Princeton University, in 1834, then took up newspaper work, becoming assistant to his father-in-law, William Cullen Bryant, who was then managing editor of the New York Evening Post. For a time he was editor of Putnam's Magazine. He wrote *A Popular View of the Doctrines of Charles Fourier*, 1844; *Vala, a Mythological Tale*, 1851; *A History of France*, 1861; *Out of the Past*, 1870; *The Biography of William Cullen Bryant*, 1883; and *A New Study of the Sonnets of Shakespeare*, 1900.

GODWIN, WILLIAM (1756-1836), Eng. doctrinaire; *b.* at Wisbech; became Glasite minister, and held charges at Ware, Stowmarket, and Beaconsfield; wrote *Inquiry concerning Political Justice*, a philosophic work showing influence of Rosseau; *History of Commonwealth*, *Caleb Williams*, a novel; and other works.

GODWINE (*d.* 1053), Earl of Wessex; justiciary under Canute; assisted in restoration of Edward the Confessor, 1042; exiled, 1051; *f.* of last Saxon king, Harold.

GODWIT, a spring and autumn migrant, visiting marshy estuarine areas and accompanying sand-flats; long legs and beak, and reddish plumage, with barred tail; nests in Arctic regions.

GOEBEN, AUGUST KARL VON (1816-80), Prussian general; as lieut.-general won great victories over Austria in Seven Weeks War, 1866, commander of VIII. corps against France, 1870; head of First Army, which won St. Quentin, 1871.

GOEBEN and **BRESLAU.** At the outbreak of the World War these Ger. war vessels—*Goeben*, battle-cruiser, 22,640 tons, ten 11-in. guns, 28 knots, and *Breslau*, light cruiser, 4,281 tons, twelve 4-in. guns, 25 knots—were in the Mediterranean; on Aug. 4, 1914, they bombarded Philippeville and Bona on the Fr. African coast; arrived at Messina (Aug. 5); escaping the Allied fleet, entered the Dardanelles (Aug. 10), and were nominally sold to Turkey (Aug. 13). Rechristened respectively *Sultan Selim* and *Midilli*, they took part in several naval actions in the Black Sea. The former was ultimately disabled by striking a mine near the Bosporus, but was repaired by a lining of cement. On Jan. 20, 1918, they sallied out from the Dardanelles and sank the Brit. monitor *Raglan*. *Breslau* was driven into a minefield and sunk; *Goeben* was damaged and beached at Nagara Point and was bombed by Brit. aircraft, but on June 27 was refloated and taken to Constantinople, being surrendered to the Allies after the Turk. armistice (Oct. 1918).

GOES, DAMIÃO DE (1502-74), Portuguese historian; keeper of archives and royal chronicler, 1548; wrote history of reign of King Manuel, but owing to its truth work condemned and compulsorily revised; G. tried and imprisoned by Inquisition on slight charges; an able and honest historian.

GOETHALS, GEORGE WASHINGTON (1858); American army officer and engineer; *b.* Brooklyn, N. Y. He studied at the College of the City of New York and in 1880 graduated from the United States Military Academy, entering the service in the same year as second lieutenant of engineers. In May 1898 he had risen to the rank of chief engineer of the volunteer forces. He left the volunteer service in the latter part of that year; became major of the engineer corps in 1900; studied at the Army War College, from which he graduated in 1905, and was made major-general in 1915. During his army service, from which he retired in 1916, he was identified with many important engineering

works, but his enduring fame was gained as chief engineer in the construction of the Panama Canal (1907-14). In the latter year he was made first civil governor of the Canal Zone. In the World War he served as general manager of the Emergency Fleet Corporation and also as quartermaster-general and member of the General Staff. In 1923 he was appointed Fuel Administrator for New York State during the coal shortage crisis.

GOETHE, JOHANN WOLFGANG VON (1749-1832), Ger. poet, dramatist, philosopher, and scientist; *b.* Frankfort-on-Main; at Leipzig G. studied law, 1765-68, and, inspired by Kätchen Schönkopf, wrote *Annette* (charming MS volume of lyrics, pub. 1896), and play, *Die Laune des Verliebten*. Returning to Frankfort, 1768, an invalid, he wrote *Die Mitschuldigen* (comedy). G. graduated as Doctor of Law at Strassburg, 1771; also studied bot., anat., alchemy, etc. At Strassburg he was greatly influenced by his intimate friend, Herder. *Sesenheimer Lieder* (lyrics), inspired by Frederike Brion, were written, 1770. At Wetzler (1772) he became friends with Kestner, whose fiancée, Charlotte Buff, is immortalized in *Die Lieden des jungen Werthers*, 1774, which made him world famous. In 1773 *Clavigo* and the hist. drama *Gotz von Berlichingen* (first really great work) appeared; also some dramatic satires (*Gotter, Helden and Wieland, Pater Brey, Hanswursts Hochzeit*, etc.). At this time G. became engaged for a short while to Lili Schönemann.

In 1775 he wrote the *Faust* of the 'Sturm und Drang' period (pub. as a Fragment, 1790). From 1775 onwards G. lived in Weimar, holding several responsible government posts; formed intimate friendship with Frau von Stein; ennobled, 1782. To the Weimar period belong dramas. *Egmont* (pub. 1778), *Die Geschwister* (1776), *Iphigenie* (prose version, 1778), *Harzreise im Winter*, and *Briefs aus der Schweiz* (1779), etc. The spell of an Ital. visit (1786-88) is seen in *Die Italienische Reise* (pub. 1816-17). The dramas, *Iphigenie* (poetical version, 1787) and *Torquato Tasso* (1790), are by many reckoned his masterpieces.

G. accompanied the Duke of Weimar in Fr. campaign, 1792-93; formed deep and lasting friendship with Schiller, 1794; app. director of Weimar Court Theater, 1791-1817; *Metamorphosen der Pflanzen*, 1790; *Beitrage zur Optik*, 1791-1792; *Hermann und Dorothea* (narrative poem), and some of G.'s finest ballads appeared, 1789. In 1806 G. married his mistress, Christiane Vulpius. To his later years belong *Die naturliche Tochter* (drama, 1804), first part ('Erster Teil') of *Faust*, 1808; the drama which established G.'s reputation as the greatest poet of his time. *Die Wahlverwandtschaften* (novel, 1809), autobiographical *Dichtung und Wahrheit*, 1811; *Uber Kunst und Alterthum*, 1816-32; *Zur Morphologie*, 1817-24; *Wilhelm Meister's Wanderjahre* (romance, 1821), and *Faust*, second part ('Zweiter Teil'), 1833.

GOFF, NATHAN (1843-1920), an American jurist; *b.* in Clarksburg, W. Va. He studied at Georgetown University and the University of the City of New York, took up law and began to practice in 1866. In the following year he was elected to the West Virginia House of Representatives. During 1868-81 he was U.S. district attorney in the district of West Virginia. In 1881 he was appointed Secretary of the Navy by President Hayes. From 1883 to 1889 he was a member of Congress; during 1892-11 he was justice of the Fourth Federal Circuit Court; justice of the U.S. Circuit Court of Appeals, 1912-13, and in 1913 he was elected to the U.S. Senate.

GOFFE, WILLIAM (1605-79), Eng. politician; one of judges of Charles I.; signed death warrant excluded from Act of Indemnity; fled to America.

GOG AND MAGOG.—It is thought that Biblical characters bearing these names are symbolical for nations dwelling N. of Caucasus, and hostile to Jews.

GOGO, GOGHA (21° 39′ N., 72° 15′ E.), seaport, Bombay, Brit. India, on Gulf of Cambay. Pop. 9500.

GOGOL, NIKOLAI VASILIEVICH (1809-52), Russ. novelist, poet, and dramatist; famed for his Cossack tales and realistic novels exposing the abuses of officialdom. Amongst his principal works are the *Revizor*, a satirical comedy, and a powerful novel, *Mertvuiya Dushi* (Dead Souls).

GOGRA (25° 45′ N., 84° 30′ E.), sacred river, India, rises in Himalayas; flows S.E., joins Ganges at Chapra; length, 600 miles.

GOITRE, an endemic disease occurring in various districts, characterized by enlargement of the thyroid gland in the neck, and believed to be caused by the drinking-water (containing lime and magnesium salts) of these districts. Distressful symptoms are due to pressure of the enlarged gland on the windpipe, certain nerves, and other structures in its neighborhood. The treatment is a change of air, rest, and tonics; iron,

iodine, or thyroid extract are administered, and if improvement does not take place an operation for removal of part of the gland is carried out. In *Exophthalmic G.*, palpitation of the heart, protrusion of the eyeballs, and anæmia accompany the enlargement of the gland; it is believed to be due either to nervous derangement or to excessive absorption of the secretion of the gland.

GOKAK (16° 10′ N., 74° 52′ E.), town, Bombay, India. Pop. 12,000.

GOKCHA, Armenian Sevanga (40° 30′ N., 45° 10′ E.), lake, Russian Transcaucasia; outlet by Zanga into river Aras.

GOLCONDA (17° 22′ N., 78° 26′ E.), fortress and ruined city, Hyderabad, India; capital of a kingdom in XVI. and XVII. cent's; formerly center of diamond cutting and polishing.

GOLD, a precious metal known to the human race from the earliest times and found in all parts of the globe. It is frequently met in association with other metals such as silver, copper, tellurium, platinum, lead and iron. It is heavy, malleable and ductile, and also one of the softest of metals, It is mainly used for coinage, alloyed with silver and copper, and for jewelry and other ornamental purposes. It has always been highly valued because of its unalterability as a material usuable for a multitude of trinkets and articles that endure from age to age. The Egyptians and the Greeks seized upon the metal for bedecking their persons, a custom which antedated its use for money. The adoption of gold as the world's standard of value, its universal appeal as the embodiment of riches, its unquestioned acceptance as a safe medium of trade without restriction of amount, and its strength as a commodity never sufficiently available to glut the market, has made gold alike the bulwark of the world's business and of corporate and individual wealth.

The modern development of the gold industry dates from 1848, when the metal was discovered in California, producing the famous gold rush there the following year. Soon that state yielded $36,000,000 worth of gold, and the year after $56,000,000, or much more than the annual average world production for the preceding decade. Australia and New England were next revealed as a gold producer, then Russia. Nevada presently became famous by the discovery of the Comstock Lode, which from its first working in 1861 yielded more than $470,000,000. In 1884 came the greatest gold discovery of the time, surpassing Comstock and all previous finds. This was in the Witwatersrand, Transvaal, South Africa, where gold production, up to 1922, had a value approximately, $2,000,000,000. Other sensational discoveries of gold were those in the Klondike, Canada, in 1894, and in Nome, Alaska ten years later.

The world's gold production was estimated at 12,790,367 ounces, of a coinage value of $355,100,000. In that year, South Africa as the leadng gold country (which means the Transvaal) yielded $173,250,000 of the metal. Rhodesia, another African gold-bearing region, produced $250,000,000 worth from 1890 to the end of 1921 and about $15,000,000 worth in the latter year. The second largest gold territory is the United States and Alaska, which yielded in 1921 2,422,000 fine ounces valued at $50,067,000. Australia in 1919 had a yield of $27,275,000, making almost $3,000,000,000 worth of gold extracted from her mines since their discovery, but their production has been declining some years. Canada in 1921 had a gold production of $21,327,000. Other gold countries are Mexico and Brazil.

In the United States and territories the chief gold districts are in California, Alaska, Colorado, Nevada, Arizona and South Dakota. The lesser gold-bearing states are Idaho, Montana, Oregon, Utah and the Carolinas, while the Philippines must not be disregarded as a producer of the metal.

Gold is measured by the troy ounce, and a fine ounce is pure gold, which has a fixed value at the U.S. Mint of $20.67. In 1922 the Director of the Mint estimated the stock of gold in the United States at a value of $3,656,988,551. Much of this amount is represented by bank reserves and money in circulation, and a substantial proportion was imported. The balance was metal used in the industrial arts.

In the mining of gold the operation embraces its extraction from alluvial deposits lying loose in river beds and beaches and mixed with sand, gravel or clay and known as placers, and (2) from rock formations, known as lode or quartz mining. Placer mining is the easier to operate, since the ore is largely obtainable on the surface, pure or slightly alloyed with silver, the particles varying from minute grains to substantial nuggets. Placer deposits, which merely required washing of the 'pay dirt' by individual prospectors or small groups without the need of much equipment, attracted gold seekers to California. The largest nugget found there weighed 280 ounces. Australia produced a nugget weighing 2,520

ounces, valued at about $42,000. Russia yielded one of 96 ounces and the Klondike one of 85 ounces. The discovery of shallow placer deposits account for all the gold rushes, and they are soon exhausted. Deeper deposits, overlain by lava or other strata, are less accessible and require considerable capital and equipment, such as hydraulic and dredging devices, to reach them.

In lode or quartz mining, or the pursuit of gold veins in rock, the ore is reached by shafts in the earth and drifts driven on the vein from the shafts. Sometimes tunnels are driven through the ore body or cross cuts are made through barren rock to the ore. Once found, the vein is opened up, the ore blasted and loaded into cars, whence it goes to the shaft and the surface for metallurgical treatment. Rock deposits may be veins containing gold with metallic sulphides, chiefly iron pyrites; quartz reefs containing gold, chiefly free, but also in sulphides disseminated in the quartz; silicious deposits containing gold, as found in Queenland; or quartz pebbles cemented by silica and iron oxide, the gold being chiefly in the cement, as in the celebrated and (Transvaal) Reef.

In gold-mining equipment for shallow placer work the sluice is invaluable. It is a long box of rough boards for washing the pay dirt by flushing it with water as the gravel is shoveled or dumped in, and is either portable or stationary. For deep placers, if the deposits are near a water supply and otherwise conveniently located, the hydraulic method of obtaining the ore is used. Instead of using pick and shovel and dumping the gravel into gold-saving sluices, water is conveyed to the gravel by pipes from a higher level, the gravel banks being first prepared for the washing by being loosened with explosives. Dredging by means of the endless bucket method is used for deposits in river beds or in ground not profitable or practicable of operation by the sluice system.

Lode or quartz mining calls for hoisting and winding engines, driven by steam, electricity, gas or water; pumps, steam, rod-driven, hydraulic, compressed-air or electric; locomotives for underground transit; air drills and explosives.

After the ore is taken from the mine it undergoes an intricate treatment before it appears as bullion. It is broken by crushers, then ground to fine powder and watered in a device called a stamp mill. There the pulp created by the stamping of pestles and mortar passes over quick-silvered copper plates, which attracts the gold and the amalgam thus formed catches more gold. This operation leaves a large residuum of the ore containing the gold which has not been attracted by the quick-silver on the copper plates, and which remains to be extracted. The process is called concentration, or the separation of the residual ore and the removal of the less valuable constituents preparatory to smelting. Sometimes concentration is omitted and the ore treated directly by cyanide, which dissolves precious metals from their ores when finely crushed. Another process is flotation of the crushed ore in residuum oil, where sulphides and metallic particles float on top and are skimmed and treated as concentrates, while the earthy and stone materials remain at the bottom and are discharged as tailings. Ordinary concentration is effected by devices that subject the ore to more washing mingled with slow and constant shaking. There are also hydraulic classifiers, which separate the coarser material from the gold. Finally the gold is smelted and poured into bullion molds, and even then it retains some silver, copper, and other metals, which are separated at mints or private refineries. See COINAGE AND MINT.

GOLD BEATER'S SKIN, the thin tough, outer coat of the cæcum, part of the large intestine of the ox. This coat is cleansed and stretched, coated first with fish-glue and then with albumen. Often used as a plaster to stop bleeding of slight flesh wounds.

GOLD, BICHLORIDE OF. See BICHLORIDE OF GOLD.

GOLDEN BULL, an edict issued by Emperor Charles IV. in 1356, to regulate the proceedings at an imperial election; it provided that the election of Holy Rom. Emperor should take place at Frankfort, and the coronation at Aix-la-Chapelle; and that there should be seven electors, the result being decided by majority of votes; these regulations remained in force till close of Holy Rom. Empire in 1806. Name is applicable to any document with golden seal, but is usually confined to important political charters.

GOLDEN CALF. See AARON.

GOLD COAST (5° N., 2° W.), Brit. crown colony and protectorate, including Ashanti and N. territories, on Gulf of Guinea, W. Africa; between Fr. Ivory Coast and Fr. Upper Senegal, and Niger on W. and N., and Ger. Togoland on E.; length of coast-line, 350 miles; area, *c.* 80,000 sq. miles. Climate is hot, damp, and unhealthy; country mostly flat and covered with immense forests and swamps; partly

navigable rivers are Ankobra and Volta; principal towns are Accra (capital), Addah, Cape Coast Castle, Quittah, Saltpond, Winneba, Axim, Akuse; chief products and exports are palm oil, kernels, timber, gold, india-rubber, cocoa, monkey skins; also ground-nuts, coffee, copra, ivory, etc.; output of gold, which gives its name to the colony, is rapidly increasing; was valued at $4,450,000 in 1922; silver, copper, and iron also found; government railway from Sekondi on coast to Kumasi, 168 miles; lines between Accra and Mangoase (40 miles), and Tarkwa and Prestea (20 miles), under construction; cables to London and Cape Town; regular steamers from London, Southampton, Plymouth.

G. C. was discovered by Portug., Santander (1470); Diego d'Asambuja built the fort St. Gorge la Mina (present Elmina), 1481; Dutch obtained part of G. C., 1717; Royal African Co. established Dixcove, Winneba, and Accra, 1672; Britain obtained Christianbourg, Augustenbourg, and Fredensbourg from Danes, 1851; and bought Dutch part, 1871-72. Ashanti with chief town Kumasi, was placed under Brit. protection, 1896, and after a dangerous rising (1900) was definitely annexed (1901) with N. territories (which lie N. of 8° N.). Pop. 1920, 1,650,000. See MAP OF AFRICA.

GOLDEN FLEECE (classical myth.), the fleece of the winged ram on which Phryxus and his sister, Helle, the children of King Athamas of Thebes, escaped from the wrath of their stepmother, Ino. The recovery of the fleece was the object of the voyage of the Argonauts under Jason.

GOLDEN GATE, a strait of California. It is about 1 m. in width, and connects the San Francisco Bay with the Pacific Ocean.

GOLDEN HORDE, name given to the Kipchaks, a Tartar race, which, about 1240, rose to power in E. Europe. Their leader was Bātū Khan, whose 'golden' pavilion was erected on the Volga bank.

GOLDEN HORN. See CONSTANTINOPLE.

GOLDEN LEGEND, collection of lives of saints (*c.* 1250) by Dominican Jacobus de Voragine; Caxton printed Eng. translation (1483).

GOLDEN ROD, the common name for herbaceous plants of the genus *Solidago*, natural order Compositæ. The inflorescence is usually a raceme consisting of small flower-heads; native of N. America, with one common Brit. species.

GOLDEN ROSE, ornament solemnly blessed by Pope on fourth Sunday in Lent, and sent annually to some prince or community he wishes specially to honor on account of services to Church.

GOLDEN RULE, name given to the precept of Christ in *Matthew* 8:12, Luke 6:31, 'Whatsoever ye would that men should do to you, do ye even so to them.'

GOLDFINCH (*Carduelis elegans*), cage bird.

GOLD-FISH, OR GOLDEN CARP (*Carassius auratus*), a common freshwater fish native to China and Japan. In its natural state it is brown in color, but when domesticated it develops the familiar red-gold tint, and occasionally becomes a complete albino, when it is known as the silver fish. It breeds freely in aquaria or ponds, provided the water is kept up to a temperature of 80° F.

GOLD LEAF, a tissue of that metal, beaten out to $\frac{1}{281\frac{1}{200}}$ in. in thickness. It is beaten to such a fineness for the purpose of gilding various surfaces. The art of gold-beating was known to the ancient Egyptians and was practiced by the potters and decorators of both Greece and Rome. A German monk of the 12th century outlines a process of gold-beating almost identical with that of today, and in the days of their prosperity the skilful Florentines were famous for the art. The gold is sometimes alloyed with silver or copper, and is then cast into ingots. Powerful steel rollers flatten the ingots out to a ribbon $1\frac{1}{2}$ in. wide. After annealing, the ribbon is divided into pieces, each weighing about $6\frac{1}{2}$ grains. These pieces are interleaved in a 'cutch,' the interleaving being effected with small sheets of vellum or tough paper, about 4 in. sq. This 'cutch' or pile is set on a firm marble block and beaten with a seventeen-pound hammer, until the gold has spread to the size of the paper screens. Each gold sheet is cut into four, and again interleaved, this time in a 'shoder,' whose leaves are made of 'gold-beater's skin' (*q.v.*). This 'shoder' or packet is beaten for two hours with a ten-pound hammer. Finally each G. L. is again divided into four and set between layers of very fine gold-beater's skin, in what is technically called a mould. Here the gold is beaten for the last time, usually for four hours. A seven-pound hammer is used. Twenty-five leaves, which are about $3\frac{1}{4}$ in. square, are sold together in a book; and the fineness of the metal is such that a grain of G. L. will gild 56 sq. in. of surface.

GOLDMAN, EMMA (1869), a Russian-Jewish anarchist agitator; *b.* in Kovno, Russia. After having acquired an advanced education in various universities of Europe, she came to the United States, in 1886, and soon after acquired notoriety in connection with the Haymarket riots in Chicago. In 1906 she established the anarchist publication Mother Earth. In 1917 she was tried for conspiracy under the Draft Law, for which she was eventually sentenced to two years in the penitentiary and fined $10,000. In the fall of 1919 she was deported to Russia, but in spite of her supposed sympathies for the Bolshevist rulers of Russia, was compelled to leave that country for Berlin, Germany, after many strong protests against conditions in Russia. She has written *Anarchism and Other Essays*, 1910, and *The Social Significance of the Modern Drama*, 1914.

GOLDMARK, KARL (1832-1915), Hungarian composer; wrote operas *Queen of Sheba, Merlin*; *Country Wedding* Symphony, etc.

GOLDONI, CARLO (1707-93), Ital. dramatist; founder of the modern school of Ital. comedy, which replaced earlier pantomimic buffoonery; wrote *Memoires*.

GOLDSBORO, a city of North Carolina, in Wayne co., of which it is the county seat. It is on the Southern, the Atlantic Coast Line, and the Norfolk Southern railroad, and on the Neuse river. It is the center of an important cotton growing district and has also extensive industries, including the manufacture of cotton, cottonseed oil, lumber, rice, furniture, agricultural implements, woolen goods, etc. It has an Odd Fellows' Orphan Home, the Eastern Insane Asylum, a hospital, sanitarium, and a park. Pop. 1920, 11,296.

GOLDSMITH, OLIVER (1728-74), Brit. poet, dramatist, and man-of-letters; *s.* of an Irish clergyman; *b.* Pallas, Longford, Ireland; ed. at Trinity Coll., Dublin, and afterwards studied med. at Edinburgh and Leyden. Then he wandered on foot over Europe, and at length, having failed in everything he undertook, turned bookseller's hack in London. After severe struggles G. began to be known in literary society, and made the acquaintance of Johnson, Burke, Reynolds, Garrick, and others. He was plain looking, and marked with smallpox; generous to a fault; extremely foolish in most of his actions; lacking in the ability to make money systematically, or to take care of it when made; but he was beloved by everybody. His *Vicar of Wakefield*, 1766, is one of the masterpieces of Eng. fiction, and his brilliant comedy, *She Stoops to Conquer*, 1773, still maintains its popularity. His play, *The Good-Natured Man*, though little read now, was much esteemed during his lifetime. His poem, *The Deserted Village*, will not readily be forgotten. G. wrote many other works—histories, biographies, essays, and poems. Johnson said of him that he 'left scarcely any style of writing untouched, and touched nothing that he did not adorn.'

GOLDSTÜCKER, THEODOR (1821-79), Ger. scholar; prof. of Sanskrit in Univ. Coll., London; author of *Sanskrit Dictionary* and other works.

GOLETTA (36° 48′ N., 10° 18′ E.), port, Tunisia, N. Africa; connected with Tunis (11 miles S.) by ship canal traversing shallow salt lake. Pop. 4,000.

GOLF, 'The Royal and Ancient Game' of golf is generally regarded as originally a Scot. pastime, but there is good reason for believing that it was first played in Holland. When it was introduced into Scotland is not known, but it was certainly largely played there in the 15th cent. Clubs began to be established early in the 18th cent.; that at St. Andrews—the 'Mecca' of golfers—was founded in 1754. James I. instituted a club at Blackheath, 1608; Charles I. was fond of the game, and is known to have played it on the Links of Leith. It is certain that Scotland kept alive the traditions and practice of the game, which did not find favor in England generally until the second half of the 19th cent. During the last thirty years it has come rapidly into favor in all English-speaking countries, and, indeed, in almost all parts of the world, while in America its popularity has increased enormously. Its practice, interrupted during the World War, has been resumed with even greater vigor. Formerly solely a man's game, it is now equally popular with both sexes.

Golf is played under ideal conditions on ground by the sea, with short, springy turf, diversified with sandy depressions called 'bunkers.' 'Inland' greens are hilly ground or flat meadows in which artificial 'bunkers' and other 'hazards' have to be provided. A full-length course has eighteen 'holes,' placed at 150 to about 500 yds. apart. Holes, about 4 in. in diameter, are placed in smooth 'putting' greens. The game is usually played by two persons, each provided with a small hard ball (of gutta and rubber), or by four persons, two players on each side, who strike the same ball alternately; the match is then called a

'foursome'. The object of each player is to get his ball from the 'teeing-ground' (the starting point for each hole) into the hole with the least number of strokes. The one who plays the holes in the fewest strokes wins the match. For the purpose of driving the ball from good or bad positions a variety of clubs is used. Some of these have wooden heads, others iron, the principal clubs being the driver, brassy (wood); the cleek, iron, mashie, niblick (iron); and the putter (iron, aluminum, or wood). Amongst the best-known English and American players are Evans, Ouimet, Travers, Sweetser and Sarazen (champion in 1922), Braid, Vardon, Taylor and Jones.

GOLGOTHA, the scene of the crucifixion of Christ, being a small hill just outside Jerusalem. It has been identified with a knoll on the N. side of the city, close to the Damascus Gate, and was probably the place of public execution according to the Mosaic law. The Hebrew word G. means 'a skull', but it is uncertain whether this refers to the shape of the hill or to the skulls of criminals which might be found there.

GOLIARDS, riotous European students of the Middle Ages, whose songs were directed against the asceticism of the Church.

GOLIATH, famous giant of Gath, slain in single combat with David, who was armed only with a sling and stone (1 *Samuel* 17).

GOLTZ, BARON KOLMAR VON DER (1843-1916), Ger. soldier, commonly known as Goltz Pasha; *b.* Bielkenfeld, E. Prussia; fought and was wounded in the Austrian campaign, 1866; became lecturer on military history at Berlin, and wrote his classic works, *Rossbach and Jena* and *A Nation in Arms*, 1883. From 1883 to 1895 he was engaged in reorganizing the Turk. army, and was identified with the Young Turk movement, 1908. The ignominious defeat of Turkey in the Balkan War, 1912, adversely affected his reputation. In 1913 he retired from the Prussian army with the rank of field-marshal. In the World War he was governor of Brussels, Sept.-Oct., 1914, and supervised the defenses of the Dardanelles and the Turk. campaign generally. He died, or was assassinated, on the day after the fall of Trebizond, April 14, 1916.

GOLTZIUS, HENDRIK (1558-1617), Dutch engraver; famed for portraits, and imitations of Michaelangelo.

GOMAL, GUMAL (32° 10′ N., 69° 30′ E.); river and important pass, on borders of India and Afghanistan.

GOMERA (28° 8′ N., 17° 22′ W.); one of Canary Islands; chief town, San Sebastian. Area, 144 sq. miles. Pop. 15,500.

GOMEZ, DE AVELLANEDA, GERTRUDIS (1814-73), Span. dramatist and poet; her literary dramas include *Saul*, *Baltasar*, and *Alfonso Munio*.

GOMEZ, DIOGO (DIEGO) (fl. 1460), Portug. sailor, explorer, and author; judge at Cintra, 1466; wrote chronicle in Latin on life of Prince Henry the Navigator.

GOMEZ, MAXIMO (1826-1905), Cuban soldier, took part in rebellion of 1868, and was appointed commander-in-chief at rising of 1895, defeating Castillanos at Puerto Principe, 1896, and successfully resisting Span. forces, 1896-8; resented Amer. intervention, 1898, but, on cession of Cuba to U. S., accepted terms offered by the latter.

GOMPERS, SAMUEL (1850), American labor leader; *b.* London, Eng. He came to America at the age of 13 and worked at cigar making. In 1881 he helped to found the American Federation of Labor, with which he has ever since been identified. Since 1882, with the intermission of one year, he has been president of that organization, and under his direction it has become one of the most powerful labor bodies in the world. Mr. Gompers has worked indefatigably to advance its interests and strengthen its influence. He has written many articles on labor questions and has edited the official magazine of the Federation, besides making a vast number of speeches in defense of the rights of labor. In the main his influence has been steadying and conservative, and he has successfully combated the efforts of radicals and communists to gain control of the organization. In international labor conferences also he has stood for law, order and moderation. During the World War he placed all the resources of the Federation at the disposal of the American Government. He has been a prominent figure in procuring enactment of eight-hour legislation, employers' liability laws, and similar measures. He also secured the inclusion in the Clayton Anti-Trust act of a provision that removes associations of wage earners from the provisions of trust legislation. His publications include: *Labor in Europe and America*, *American Labor and the War*, *Labor and Common Welfare*, *Labor and the*

Employer, Out of Their Own Mouths. In 1921 he was a member of the Disarmament Advisory Commission.

GONAÏVES, a seaport of Haiti, situated on the W. coast, at the head of the Gulf of Gonaïves, nearly 70 m. N.N.W. of the town of Port au Prince. Played an important part in the declaration of Haitian independence, Jan. 1, 1804. Pop. 13,500.

GONCOURT, EDMOND LOUIS ANTOINE HUOT DE (1822-96 and **JULES ALFRED HUOT DE** (1830-70), Fr. authors of early naturalist school; collaborated in writing histories and novels, including *Portraits intimes du XVIIIe siecle, L'Art du XVIIIe siecle, Saeur Philomene,* etc.

GONDA (27° 7′ N., 82° E.), town and district, Fyzabad division, United Provinces, India. District: area, 2,813 sq. miles. Pop. 1,500,000. Town: pop. 17,000.

GONDAL (21° 55′ N., 70° 52′ E.), native state, in Kathiawar, Bombay, India.

GONDAR (12° 37′ N., 37° 29′ E.), town, Abyssinia, Africa; formerly capital; much decayed; numerous ruined castles, palaces, and churches; cotton, gold, silver, and fine leather manufactures; partly burned by Dervishes, 1889. Pop. 8,000.

GONDIVES, town, W. Haiti; harbor; birthplace of Haitian independence, Jan., 1804. Pop. 13,000.

GONDOKORO (4° 54′ N., 31° 40′ E.), village on Upper Nile, at frontier of Egyptian Sudan; trading center.

GONDOLA, kind of boat; long, narrow, and flat-bottomed, high prow and bow, propelled by single oar; used on Venice canals.

GONDOMAR, DIEGO SARMIENTO DE ACUÑA, COUNT OF (1567-1626), Span. diplomat; ambassador to Eng court, 1613-18 and 1619-22; prevented James I. from joining anti-Span. alliance.

GONFALON, state banner of the Middle Ages, particularly that borne in procession by the magistrates (*gonfaloniers*) of the Ital. republics.

GONIOMETER in its simplest form, Contact g., is a graduated semicircle of metal at the center of which two rules are pivoted together. Between these the angles of large crystals with dull faces are measured. The Reflecting g., used for small bright crystals which reflect sharply defined images, measures the angle between the normals to two faces, (*i.e.,*) the angle of rotation necessary to superpose the image reflected from the second face on that reflected from the first, while the crystal is rotated about an axis parallel to the edge between two faces.

GONORRHŒA, inflammatory condition of the mucous membrane of the urethra and other genito-urinary passages, caused by a specific organism, the *gonococcus,* and usually resulting from impure sexual intercourse.

GONSALVO DI CORDOVA, see CORDOVA, GONZALO, FERNANDEZ DE.

GONTAUT, MARIE JOSEPHINE LOUISE, DUCHESSE DE (1773-1857), celebrated Frenchwoman, associated with court of Charles X.; her *Memoirs* give an interesting account of period (Eng. trans., 1894).

GONVILLE, EDMUND (*d.* 1351); Eng. ecclesiastic; part-founder of Gonville and Caius Coll., Cambridge.

GONZAGA, Ital. family, rulers of Mantua from 1328 to 1708; often at war with the Viscontis of Milan. Giovanni Francesco II. obtained marquisate for military services to Emperor Sigismund, 1432; and Federigo II. was cr. duke by Emperor Charles V. in 1530. Line became extinct, 1708.

GONZAGA, THOMAZ ANTONIO (1744-1809), Portug. poet; wrote a collection of love poems, entitled *Marilia,* which achieved great popularity.

GOOD, JOHN MASON (1764-1827); Eng. author; chiefly known for his *History of Medicine,* 1795, and his trans. of Lucretius.

GOOD FRIDAY, name given to the Friday before Easter, on which the Savior was crucified. It is kept as a very solemn fast in the R. C. Church, increasingly so in the Anglican, not so much among Nonconformists.

GOODALL, FREDERICK (1822-1904), Eng. artist; at fourteen was awarded the 'Isis' medal of the Soc. of Arts, two years later gaining the silver medal from the same body; at seventeen he exhibited at the Royal Academy; elected A.R.A. 1852 and R.A. 1863; first confined himself to subjects of Eng. life, later to historical subjects. His visit to Egypt, 1857-9, strongly influenced his work, and his Eastern and Scriptural pictures proved very popular with the public. He also met with some success in portraiture. His style was conventional but attractive.

GOODE, GEORGE BROWN (1851-96), an American scientist, *b.* in New

Albany, Ind. After studying at the Harvard Museum of Comparative Anatomy, he became connected in 1874 with the fish commission of the United States Natural Museum. In 1887 he became assistant secretary of the Smithsonian Institution. He was one of the leading authorities on fishes.

GOODELL, CHARLES ELMER (1867), a college president; *s.* of Harrison and Mary Taylor Goodell. Graduated from Franklin College in 1888 and took postgraduate work at Cornell and at Chicago University. Became professor of history at Franklin College in 1894. Taught at Denison University from 1903 to 1917, in which year he was called to presidency of Franklin College. Member of a number of scientific societies and has contributed to various scientific journals.

GOOD HOPE, CAPE OF. See CAPE OF GOOD HOPE.

GOODING, FRANK R. He was *b.* in England and came to the United States with family in 1867. Received education in public schools of Paw Paw, Mich. Was for several years a mining contractor, and later took up farming and sheep raising. Was one of the largest sheep owners in Idaho. Served in Idaho State Senate for four years. Became Governor of State of Idaho in 1905. Appointed to fill unexpired term in United States Senate in 1921. Elected to United States Senate for full term 1921-1927.

GOODMAN, JULES ECKERT (1876), American dramatist, *s.* of Newman and Jeanette Rothschild Goodman. Graduated from Harvard in 1899. Became managing editor of Current Literature, later going to the Mirror. Has written extensively for all leading magazines. His principal plays include *The Test, The Man Who Stood Still, Mother, The Silent Voice, The Man Who Came Back, Business Before Pleasure, Why Worry, His Honor, Abe Potash,* and *Pietro.*

GOODNOW, FRANK JOHNSON 1859), an American university president; *b.* in Brooklyn, N. Y. He graduated from Amherst College, in 1879, continuing his studies in Paris and Berlin. He was Eaton professor of administrative law at Columbia University, after 1903, and dean of political science there during 1906-7. During 1913-14 he was legal advisor to the Chinese Government. Since 1914 he has been president of Johns Hopkins University. He is the author of many books, among these being *Comparative Administrative Law,* 1893; *Municipal Government,* 1910; *Social Reform and the Constitution,* 1911, and *Principles of Constitutional Government,* 1916.

GOODRICH, CASPAR FREDERICK (1847), an American admiral; *b.* in Philadelphia, Pa. He graduated from the naval academy at Annapolis in 1864, and was promoted through the various grades, becoming rear-admiral in 1904. During 1905-6 he had command of the Pacific Squadron. He retired in 1909.

GOODRICH, SAMUEL GRISWOLD (1793-1860), an American writer; *b.* in Ridgefield, Conn. He was at first a publisher in Hartford, Conn., then in Boston, Mass., later being editor of The Token, and as such publishing some of the stories of Nathaniel Hawthorne. Then he began to write and publish a series of juvenile books, known as 'the Peter Farley series,' being stories of adventure, history, achievement, etc., written in a vein that proved very popular among children. From beginning to end these books numbered 116 and were read all over the country and in England. He also wrote more serious works, among these being *The Outcast, and Other Poems,* 1837; *Recollections of a Lifetime,* 1857; and his best known work, *An Illustrated Natural History of the Animal Kingdom,* 1859.

GOODRICH, THOMAS (*d.* 1554) bp. of Ely and Lord Chancellor of England, 1551-52; assisted in compilation of the *Institution of a Christian Man,* and Cranmer's *Bible,* and *Book of Common Prayer.*

GOODWIN, MAUDE WILDER (1856), an American historical novelist; *b.* in Ballston, Spa, N. Y. Her works, which at one time enjoyed a limited popularity, include *The Head of a Hundred, White Aprons, Dolly Madison* (a biography), *Historic New York,* 1898; *Four Roads to Paradise,* 1904, and *Veronica Playfair.*

GOODWIN SANDS (51° 19′ N.; 1° 35′ E.), dangerous shoals, E. of Kent, England; separated from mainland by the Downs; shifting sands; scene of many wrecks; said to be submerged estate of Earl Godwin.

GOODWIN, THOMAS (1600-80); Eng. Puritan preacher; friend of Cromwell's; member of Westminster Assembly, 1643; pres. of Magdalen Coll., Oxford, 1650-60.

GOODWIN, WILLIAM WATSON (1831-1912), an American university professor; *b.* in Concord, Mass. He graduated from Harvard University,

in 1851. In 1860 he became professor of Greek at Harvard, and remained there in that position for over forty years. He was noted as one of the highest American authorities on the Greek classics. He was the author of *The Syntax of the Moods and Tenses of the Greek Verb*, *A Greek Grammar*, and a revised translation of *Plutarch's Morals*, 1871.

GOODYEAR, CHARLES (1800-1860), an American inventor; *b.* in New Haven, Conn. After leaving school he went into his *f's* hardware business, and during this period he invented a steel pitchfork which had a wide sale. In 1830 the *f's* business went into bankruptcy, and young Goodyear went into the rubber business. Shortly after he invented what was generally called the 'nitric acid gas process,' by which native India rubber was dipped in a preparation of nitric acid, which enabled manufacturers of rubber goods to expose rubber surfaces, hitherto too adhesive to do that. It proved especially valuable in the manufacture of shoes. This invention was superseded by Goodyear's invention of the process of vulcanizing rubber, in 1844. He registered over 60 patents, but while others grew wealthy by infringing on his patents, he died in poverty.

GOOLE (53° 42′ N.; 0° 52′ W.), market town and port, West Riding, Yorkshire, England; extensive docks, iron foundries; manufactures sugar, agricultural implements. Pop. 21,000.

GOORKHAS, see GURKHAS.

GOOSE, a collective term for members of the *Anserinae*. The group is largely Arctic in character. The plumage is similar in both sexes; beak tapering and characterized by horny, knobbed tip. Geese are more terrestrial in character than either ducks or swans, and when on the wing travel in typical 'V'-shaped formation, termed by sportsmen a *skein*. The Grey Lag g. is believed to be the progenitor of the domestic species. G. liver has been considered a dainty from early times. In Holland and Germany enormous quantities of geese are reared for the market. Strassburg *pate de foie gras* is obtained from geese confined in an apartment kept at a high temperature to produce morbid enlargement of liver.

GOOSEBERRY is the fruit of *Ribes grossularia*, natural order *Ribesaceae*. The shrub has *spines* (modified leaf-bases) and alternate *crenated* three- or five-lobed leaves with dilated *petiole*. The flower has a *monosepalous* bell-shaped *calyx* with five divisions and a *corolla* of five free petals alternating with the divisions of the *calyx*. The five *perigynous* stamens are opposite the petals, and the inferior unilocular *ovary* has two short *styles*. The *ovules* are borne on two *placentas*. The fruit is a berry with a persistent *calyx* at the top, and contains sugar and malic acid. The best growth conditions are cool climate, rich loam, much manure.

GOPHER. See POCKET GOPHER.

GÖPPINGEN (48° 42′ N., 9° 40′ E.); town, on Fils, Württemberg, Germany; cotton and woolen goods. Pop. 1919. 21,629.

GORAKHPUR (26° 44′ N., 83° 23′ E.), district and division, United Provinces, India; district, flat, abounds in lakes and marshes; dense forests; chief rivers, Rapti, Gogra, Great and Little Gandak; products—timber and rice; area, 4,535 sq. miles. Pop. 3,000,000. Chief town, Gorakhpur, on Rapti; river trade, timber, grain. Pop. 64,000.

GORBODUC, legendary Brit. king, subject of the earliest Eng. tragedy, *Gorboduc, or Ferrex and Porrex*, by Sackville and Norton, played before Queen Elizabeth, 1561.

GORCHAKOV, ALEXANDER MIKHAILOVICH, GORTSCHAKOFF (1798-1883), most distinguished member of Russ. princely family; ambassador to Württemburg and Austria; Foreign Minister, 1856; Chancellor, 1863; for some time most powerful minister in Europe. To same family belong Alexander Ivanovich (*d.* 1825), and Andreas Ivanovich (1768-1855), who fought against Napoleon; Mikhail Dmitrievich (1795-1861), Russ. commander-in-chief at Crimea, who conducted defense of Sevastopol; and Peter Dmitrievich (1790-1868), who commanded division at *Alma* and *Inkermann*.

GORDIAN KNOT, inextricable knot fastened to wagon of Gordius; man who loosed it to rule world; Alexander the Great cut it with sword.

GORDIANUS, MARCUS ANTONIUS, Rom. emperor; devoted to study of letters and philosophy; emperor, 238, in 80th year, for a month, jointly with s., Gordianus (killed in battle, 238). His grandson, Gordianus, emperor, 238, inflicted great defeat on Persians; assassinated, 244.

GORDIUM (*c.* 40° N., 31° 35′ E.); ancient capital, Phrygia, on Sangarius; here Alexander the Great cut the Gordian knot.

GORDON, Scot. family; lived in Berwickshire, XII. cent.; descended from

Sir Adam G., lord of Huntly, Aberdeenshire, 1318; became Earls and Marquesses of Huntly and Dukes of G.; dukedom extinct, 1836; granted to Duke of Richmond, descendant in female line, 1876.

GORDON, ADAM LINDSAY (1833-70), Brit. poet; ed. Cheltenham and Oxford; afterwards went to Australia and pub. *Bush Ballads* and other vol.'s of lyrics; committed suicide.

GORDON, CHARLES GEORGE (1833-85), Brit. general and administrator; *b.* Woolwich; served in Crimea, 1855-56; joined military expedition to China, 1860; present at capture of Peking. During Taiping rebellion he took command of some Chin. troops, trained by European and Amer. officers; relieved Chansu, 1863; fought over thirty actions and seized several towns, including Suchow and Chanchufu; final suppression of rebellion largely due to his leadership; refused all pecuniary rewards from Chin. emperor. On returning home G. became Commanding Royal Engineer at Gravesend. Entering service of Khedive of Egypt in 1873, for nearly seven years (the last three as gov. of entire Sudan) he labored indefatigably to establish law and order in Upper Nile district; resigned on failing to arrange peace between Egypt and Abyssinia, 1880; returned to Sudan at request of Brit. Government, 1884, to quell Mahdi's rebellion; shut up in Khartum by rebels; bravely defended city for a year, but was treacherously killed two days before the arrival of relief force under Wolseley.

GORDON, CHARLES WILLIAM (RALPH CONNOR) (1860), a Canadian novelist; *b.* in Ontario, Canada. He graduated from Toronto University, in 1883, studied theology and was ordained a Presbyterian minister. During 1890-3 he was a missionary in the lumber regions of the Northwest, becoming pastor of St. Stephen's Church, in Winnipeg, in 1894. He has written many novels, among these being *Beyond the Marshes*, *Black Rock*, *The Sky Pilot*, *The Man from Glengarry*, and *The Major*.

GORDON, GEORGE ANGIER (1853), an American clergyman and theological writer; *b.* in Scotland. He came to this country as a youth and graduated from the Bangor Theological Seminary, in 1877, being ordained a Congregational minister soon after. For a time he was pastor of the Old South Church, in Boston; he was university preacher at Harvard University, during 1886-90 and 1906-9 and was Lyman Beecher lecturer at Yale University during 1901. Among his works are *The Witness to Immortality*, 1893; *The New Epoch of Faith*, 1901; *Through Man to God*, 1906, and *Humanism in New England Theology*, 1920.

GORDON, LORD GEORGE (1751-93), *s.* of Duke of G., fanatical leader of Gordon Riots, 1780—a violent protest against removal of R. C. disabilities.

GORDON, JOHN BROWN (1832-1904), a Confederate soldier; *b.* in Upson County, Ga. After graduating from the University of Georgia, in 1852, he studied law and engineering. When the Civil War broke out he was engaged in an engineering project in the Racoon Mts., and immediately organized a company of miners, which was called the 'Racoon Roughs,' with which company he entered the war as captain. At the Battle of Seven Pines he was a colonel, but on account of his general being wounded, he assumed command of his brigade leading it in the fighting so skillfully that he was made a brigadier-general. At the Battle of Gettysburg he gained the Confederates the initial victory by striking the Federal right wing and driving it through the village in disorder. As major-general he had command of nearly half of Lee's army at Appomattox, at which battle he showed his usual high qualities as a soldier. After the war he was twice Governor of Georgia, and served two terms in the U. S. Senate. He wrote *Reminiscences*, 1905.

GORDON-CUMMING, ROUALEYN GEORGE (1820-66), Scot. traveler and hunter; wrote *The Lion Hunter of South Africa*.

GORDON-BENNETT, MOUNT, a peak 15,000 feet above sea level, in Central Africa, in the Ruwenzori Range, near Albert Nyanza. It was discovered by the explorer, Henry Stanley, in 1875 and by him named in honor of his patron, Gordon Bennett, who was financing his expedition in search of Livingston.

GORDY, WILBUR FISH (1854), American educator, *s.* of Elijah Nielson and Martha Gordy. Graduated from Wesleyan University in 1880. Became superintendent of schools, Ansonia, Conn., in 1881. Held same position in Springfield, Mass., until 1911. Lectured extensively on educational subjects throughout New England. Author of the following works, many of which are standard text books: *A School History of the United States*, 1897; *American Leaders and Heroes*, 1901; *Colonial Days*, 1907; *American Beginnings in Europe*, 1911; *Abraham Lin-*

coln, 1917; *Causes and Meanings of the Great War*, 1919.

GORE, CHARLES (1853); Eng. theologian; Fellow of Trinity Coll., canon of Westminster, then bp. of Worcester, 1902-4, of Birmingham, 1905-11; since 1911, of Oxford.

GORE, THOMAS PRYOR (1870), a U. S. Senator; *b.* in Webster County, Miss. Considerable interest has been attached to his personality on account of his being totally blind; at the age of eight he lost one eye by being struck with a stick by a playmate, and at the age of 11 he lost his other eye by an arrow from a cross bow. In 1892 he graduated from Cumberland University, in Tennessee and began to practice law. He removed to Texas, in 1895, where, in 1898, he was a candidate for Congress on the Populist ticket, but was defeated. In 1901 he removed to Oklahoma, where he was elected to the U. S. Senate for the terms of 1909-15 and 1915-21, as a Democrat.

GORÉE (14° 39′ N.; 17° 15′ W.), small island, Fr. Senegal, W. Africa, E. of Dakar; chief town, Gorée; large harbor; formerly important commercial entrepôt.

GORGAS, WILLIAM CRAWFORD (1854-1920), American army surgeon; *b.* Mobile, Ala. He graduated at the University of the South in 1875 and from the Bellevue Hospital Medical College, New York University, in 1879. He was appointed surgeon in the U. S. Army in 1880 and became major surgeon in 1898. In the latter year he was appointed chief officer in charge of sanitary work at Havana, Cuba, and so successfully applied methods of combating yellow fever that he eliminated that disease, which had been the curse of Cuba. His brilliant work in that office caused him to be made surgeon general by a special act of Congress in 1903. In 1904 he was appointed chief sanitary officer of the Panama Canal Zone, and his work there in exterminating tropical diseases paralleled his achievements in Havana. He retired from active service in 1918 and became the director of yellow fever research in the Rockefeller Foundation. Several South American countries availed themselves of his ability in fighting fevers with remarkable results. He was awarded medals and honors by many of the world's greatest scientific societies. Italy decorated him in 1918 and France in 1919.

GORGES, SIR FERDINANDO (*c.* 1566-1647), Eng. soldier and colonist; was prisoner in Spain; fought for Henry IV. of France; sometime gov. of Plymouth; later became founder and chartered proprietor of Maine, New England, 1639.

GORGET, broad collar-piece, worn with suit-armor in England, XV.-XVII. cent's.

GORGIAS OF LEONTINI, famous Sicilian rhetorician and sophist, *b.* about 480 B.C. In 427 B.C. he was sent to Athens to petition aid against Syracuse. The remainder of his life was spent in Athens as a teacher of rhetoric, and at Larissa. His style was highly ornate, rich, and elaborate, and considerably influenced the oratory of Demosthenes, though its effects on rhetoricians of inferior calibre was vicious. Plato's treatise on rhetoric is called the *Gorgias*, and in it G. is made to express his views on the art of oratory.

GORGONS, THE (classical myth.), Medusa, Stheno, and Euryale, female monsters, dwelling beyond the Western ocean, who turned to stone any mortal who looked upon them. Medusa alone was mortal, and was slain by Perseus.

GORGONZOLA (45° 32′ N., 9° 23′ E.), town, Milan, Italy; famous cheese. Pop. 5,000.

GORILLA, a large man-like ape, which is a native of W. Africa. It can be distinguished from the chimpanzee by the small ears, elongated head, the presence of a deep groove alongside the nostrils, the small size of the thumb, and the great length of the arm, which reaches half-way down the shin-bone in the erect posture. It also differs from the chimpanzee in its greater size; the height of a male G. being from 5½ to 6 ft. In color it is blackish, but the hair on the head and shoulders often has a reddish tinge. It is chiefly a vegetable feeder, but, like most apes, it also preys upon small mammals, birds, and their eggs. The G. spends most of its time on the ground, although it is a skillful climber, and is not so very ferocious, for when attacked it generally avoids an encounter, but when driven into a corner is a dangerous enemy on account of its enormous strength. G's. have not yet been tamed, and fully adult ones have never been seen alive in captivity. Various attempts have been made to add one to the Zoological Gardens, but the animals have all died young.

GORINCHEM, GORKUM (51° 49′ N. 4° 59′ E.), fortified town, on Merwede, S. Holland, Netherlands; salmon fisheries; trade in grain, cattle. Pop. 12,500.

GORKY, MAXIM, pseudonym of Alexei Maximovitch Pyeshkoff (1868), Russian author. Left an orphan at 9, he led a roaming life, engaging in almost every variety of occupation, and for a time wandered over Southern Russia as a tramp. The sordidness of his experiences prompted an attempt at suicide when he was 19. Later on, these experiences stood him in stead as a realistic writer of stories portraying the lowest depths of human life and experience. His first story, *Makar Chudra*, appeared in 1892, and its striking quality gave notice that a new force had arisen in Russian literature. Many other stories followed, all of them enhancing his reputation. In 1906 he visited several European countries where he received a marked welcome, but a later trip to the United States was marred by criticism from the fact that he was accompanied by a woman, not his wife. His principles were radical, and he frequently came into conflict with the Czar's Government, being twice arrested and banished. At the outbreak of the war he joined the Russian Army and in 1917 took part in the movement that led to the deposition of the Czar. Although he has disagreed with the Bolshevist authorities on some points, he has been to a certain extent the spokesman of the Soviet. During the famine of 1922, his appeals for help to the foreign governments of the world were poignant and powerful. His work, while exceedingly brilliant in characterization, is imbued with the pessimism and sense of futility that mark Russian fiction in general. His publications include: *Twenty-six and One*, 1902; *Heartache, and the Old Woman Izerofel*, 1905, *The Individualists*, 1906; *The Spy*, 1908; *A Confession*, 1910; *My Childhood*, 1915; *In the World*, 1917; *Reminiscences of L. N. Tolstoy*, 1920. Among his plays may be mentioned *The Smug Citizen*, and a *Night's Lodging*, the latter portraying the most appalling depths of human degradation.

GORLITZ (51° 9′ N., 15° E.), town, Silesia, Prussia; important commercial center; principal edifice, XV.-cent. Gothic church of St. Peter and St. Paul; cloth, machinery, and glass manufactures. Pop. 1919, 80,332.

GÖRRES, JOHANNES JOSEPH VON (1776-1848), Ger. author and publicist; prof. of physics in Coblenz Univ., 1800-14; began to pub. his *Die deutschen Volksbucher*, 1807, and became a leader of the Ultramontane party. His chief work was *Christliche Mystik*, 1842.

GORST, SIR ELDON (1861-1911), Eng. and Colonial politician; *b.* New Zealand; controller of direct taxes to the Egyptian Government, 1890; undersecretary of state for finance, 1892; financial adviser to Egyptian Government, 1898-1904; assistant under-secretary for foreign affairs, 1904-7; Brit. agent and consul-general in Egypt, 1907-11.

GORTYNA (35° 10′ N., 25° E.), ancient city, Crete, on river Lathæus.

GÖRZ AND GRADISCA, prov. Italy, formerly county and crownland of Austria (45° 57′ N., 13° 38′ E.), between Carniola on E. and Venetia on W.; cap. Görz; surface very mountainous; principal river, Isonzo; extensive vineyards; exports wine and fruit; silk culture an important industry; pop. mainly Slavic and Catholic; prov. belonged to Austria from 1500 till it was given to Italy by Peace Treaty after World War. Area, 1,127 sq. m.; pop. 260,800.

GOSCHEN, GEORGE JOACHIM, VISCOUNT (1831-1907), Brit. statesman and financier; grandson of celebrated Leipzig bookseller, 1752-1828, of same name; First Lord of Admiralty, 1871; ambassador to Constantinople, 1880 opposed Home Rule and joined Unionists; Chancellor of Exchequer 1887-92; converted National Debt, 1888; again First Lord of Admiralty, 1895-1900.

GOSHAWK, a member of the HAWK FAMILY.

GOSHEN (30° 18′ N., 32° E.), region, Lower Egypt; settled by Israelites before the Exodus.

GOSHEN, a city of Indiana, in Elkhart co., of which it is the county seat. It is on the Lake Shore and Michigan Southern, and the Cleveland, Cincinnati, Chicago and St. Louis railroads, and on the Elkhart river. It is an important industrial community and has manufactures of wool, rubber goods, furniture, iron, flour, farming implements, and condensed milk. The public buildings include a court-house, high school and a library. The city is the seat of Goshen College. Pop. 1920, 9,525.

GOSHEN, a village of New York, in Orange co., of which it is the county seat. It is on the Erie, and Lehigh and New England railroads, about 60 miles northwest of New York City. It is the center of an important agricultural and dairying community and has a large trade in cheese and butter. There is a court-house, churches and banks. Pop. 1920, 5,016.

GOSHUN, MATSUMURA (1752-

1811), Jap. artist; founder of the Shijo school; work something akin to that of Okyo, but broader in general effect; used color more sparingly, and built up his forms more simply. He was highly successful as a teacher, and his pupil, Keibun, 1779-1843, carried the school to the height of its glory.

GOSLAR (51° 55′ N., 10° 25′ E.), town, Hanover, Prussia, on Gose; has numerous fine old churches and quaint buildings; imperial palace, recently restored, formerly favorite residence of Ger. emperors; silver, copper, lead, sulphur mines; passed from Hanover to Prussia, 1866. Pop. 18,000.

GOSNOLD, BARTHOLOMEW (*d.* 1607), an English navigator, who sailed from Falmouth, 1602, in the 'Concord,' and discovered Cape Cod and some neighboring islands. He was the leader of an expedition which discovered the Virginian Capes, and founded Jamestown in 1606, where he died.

GOSPEL (literal meaning—good news) was originally applied to the proclamation by Christ of the kingdom of heaven. Canonical g's are first four books of New Testament, with which are associated names of Matthew, Mark, Luke, and John; these were probably written in second half of I. cent. A. D., when the spread of Christianity made written accounts of its origin necessary. First three are called the *Synoptic* g's because of their similarity of matter, method, and style; while St. John's account differs in all three respects. It is now generally believed that St. Mark's G. was written first, and was derived from, and practically identical with, an earlier document; and that Matthew and Luke wrote their accounts by combining this early document with another known as the *Logia*, a compilation of Christ's sayings.

GOSPORT (50° 48′ N., 1° 8′ W.), seaport, Hampshire, England, opposite Portsmouth, with which it is connected by floating bridge; contains Clarence victualling yard; yacht-building. Pop. 33,000.

GOSSAMER, fine threads, or webs, formed by spiders, generally attached to trees or plants; hence anything of a light, flimsy nature.

GOSSARD, GEORGE DANIEL (1868), American college president. Graduated from Otterbein University, Ohio, in 1892. Later a postgraduate student at Johns Hopkins. Ordained in United Brethren Church in 1897. Elected president of Lebanon Valley College, Pa., in 1912.

GOSSE, EDMUND (1849), Eng. critic and miscellaneous writer; was appointed assistant librarian in the Brit. Museum, 1867; removed to the Board of Trade as translator, 1875; librarian at the House of Lords, 1904-14. His most recent works include *Inter Arma*, 1916; *The Life of Algernon Charles Swinburne*, 1917; *Three French Moralists*, 1918; *Diversions of a Man of Letters*, 1919.

GOSSE, PHILIP HENRY (1810-88), Eng. naturalist; a careful observer of *marine fauna*; his *Actinologia Britannica* is a standard work on sea-anemones.

GOSSIP (Anglo-Saxon, *God* and *sib*), word meaning (1) sponsor or godparent, (2) friend, (3) idle tattler, (4) idle talk.

GOTA (58° N., 12° 2′ E.), river, Sweden, flowing from Lake Vener into the Cattegat; length, 50 miles; navigable throughout. Gota Canal, connects Baltic and Cattegat by way of Lakes Vetter and Vener.

GOTAMA, see BUDDHA.

GOTHA (50° 57′ N., 10° 4′ E.), town, Thuringia, Germany; principal building —Friedenstein castle, 1643, with library, cabinet of coins, museum of antiquities, and picture-gallery; contains famous geographical publishing house of Justus Perthes (who pub. well-known *Almanach de Gotha*); important industrial center; manufactures sausages. Pop. 1919, 41,465.

GOTHAM, WISE MEN OF, old name given to inhabitants of Gotham, a Nottinghamshire village, who were notorious for their stupidity. Washington Irving applied this name to New York City.

GOTHARD, ST., pass, Alps (46° 30′ N., 8° 40′ E.); 6,936 ft.; from Ticino to Upper Reuss valley; railway tunnel, over 9 m. long, opened in 1882.

GOTHENBURG (57° 39′ N., 11° 59′ E.), seaport, Sweden, on Göta-Elf; large commercial and industrial center; traversed by numerous canals; consists of old and new town, with fine harbor (seldom blocked by ice); chief industries, shipbuilding, machinery, textiles, woodpulp, sugar-refining, brewing; founded by Gustavus Adolphus, 1618; rose to commercial importance during continental blockade, 1806; gives name to famous licensing system. Pop. 1921, 202,366.

GOTHIC ARCHITECTURE, see ARCHITECTURE.

GOTHS, Teutonic race whose earliest-known home was the S. shores and

islands of Baltic, where they are found in I. cent. A. D. They gradually migrated southwards through central Europe, and early in III. cent. settled in districts to N. of Danube and Black Sea. In this cent. they first came into contact with the Romans, whom they routed at *Abrita* in 251; thereafter for 20 years they ravaged Asia Minor and Balkan regions, and in 270 they obtained the concession of Dacia from Emperor Aurelian. By middle of IV. cent. they had become dominant race of non-Roman Europe, their kingdom stretching in broad band from Black Sea to Baltic. Principal subdivisions of nation are Ostrogoths, or East Goths, and Visigoths, or West Goths. The Visigoths were driven across the Danube by invading Huns, *c.* 375, and settled under Rom. rule; under Alaric they rose in rebellion, overran Greece and Italy, and captured Rome in 410; after Alaric's death they left Italy for Gaul, but were subsequently driven by Franks across Pyrenees, and established a kingdom in Spain which lasted until VIII. cent., when the country was subdued by Muslims. The Ostrogoths were conquered by Huns, *c.* 376, when Ermanaric, the most celebrated Gothic king, committed suicide; they remained in subjection until 451, when they regained independence; and under Theodoric they acquired most of Italy after the break up of Western Empire in 476. After wars with Romans they were eventually defeated by Justinian's general, Narses and left Italy, *c.* 552.

GOTLAND, OR GOTTLAND (57° 30′ N., 18° 30′ E.), island, Baltic Sea, belonging to Sweden; forms *lan* of G., together with several smaller islands. Chief town, Visby. Coast is steep; interior mostly level, with large extent of forest; cultivates barley, rye, wheat, oats, and beet-sugar; main industries are sheep and cattle-raising, fishing, cement-making, and lime-burning; contains large number of ruined churches. Pop. 1921, 55,804.

GOTO, GOTO RETTO, GOTTO (33° N., 129° E.), group of islands lying W. of Kiushiu, Japan.

GOTTFRIED VON STRASSBURG (XIII. cent.), Ger. epic poet; wrote *Tristan and Isolde*, which served as the foundation of Wagner's opera.

GÖTTINGEN (51° 35′ N., 9° 56′ E.), town, Hanover, Prussia; seat of famous univ. (Georgia Augusta), founded by George II., 1734, with library of over 500,000 vols.; has also Royal academy of sciences, founded 1751; book trade; manufactures scientific and mathematical instruments. Pop. 40,000.

GOUDA (52° 1′ N., 4° 42′ E.), town on Yssel, S. Holland; Groote Kerch, 1552, has fine stained glass; noted for cheese. Pop. 26,000.

GOUGH, SIR HUBERT DE LA POER (1870), Brit. soldier; educated at Eton and Sandhurst; joined the 16th Lancers, 1889, served in Tirah expedition, 1897-98, S. African War, 1899-1902, and, during World War, in France and Flanders, 1914-18; figured in the Curragh incident (see CURRAGH). He commanded 5th Army on Somme, 1916, before Arras, April, 1917, Flanders, Sept., 1917, and St. Quentin, March, 1918. See WORLD WAR.

GOUGH, HUGH, VISCOUNT GOUGH (1779-1869), Brit. general; brought first Chinese War to successful conclusion, 1842; defeated Mahrattas, 1843; Sikhs, 1844, 1849. By final defeat of Sikhs at *Gujerat* added Punjab to Brit. Empire.

GOUGH, JOHN BARTHOLOMEW (1817-1886), American temperance orator; *b.* in Sandgate, Kent, England; *d.* at Frankford, Pa. He came to America in 1829 and took up book binding, and falling into drunken ways sang for a living in grog shops. In 1842 he signed the pledge at a temperance meeting, and though he once broke his pledge, he became a noted orator and temperance advocate, touring America and England in 1853-1855 and 1857-1860. Publications, *Autobiography*, 1846, enlarged 1870; *Orations*, 1854; *Sunlight and Shadow*, 1880.

GOUJON, JEAN (1515-66), Fr. sculptor and architect; founded Fr. neo-Greek school; designed *Fountain of the Innocents* and other Louvre decorations; though following antique models, his works are modern in sentiment.

GOULBURN (34° 36′ S., 149° 43′ E.), city, New S. Wales, Australia; seat of Catholic and Anglican bp's; tanneries, boots and shoes. Pop. 15,000.

GOULD, SIR FRANCIS CARRUTHERS (1844), Eng. caricaturist, caricatured for *Truth*, *Pall Mall Gazette*, and *Westminster Gazette*; author and illustrator of *Picture Politics*, *The Modern Froissart*, *Who killed Cock Robin?*, etc.

GOULD, GEORGE JAY (1864-1923), an American capitalist, *s.* of Jay Gould; *b.* in New York City. He entered business in the banking house of W. E. Conner & Company, New York, and succeeded his father as partner in 1885. In 1888 he was appointed president

of the Little Rock and Fort Smith Railway, and from that time took an active interest in railway development. He was president and director in many important railroad companies, and was also identified with the railway systems of New York City. His residence, Georgiancourt, Lakewood, N. J., was one of the show places of the country.

GOULD, JAY (1836-1892), American financier; *b.* Roxbury, N. Y. His father was a farmer in straitened circumstances. The son worked on the farm and studied for a time at Hobart College, where he learned surveying. He made surveys of several New York counties and published a history of Delaware County in 1856. In the same year he engaged in the lumbering and tanning business in western New York. He gained experience in banking, and, following the panic of 1857, made speculative investments in railroads. He purchased the bonds of the Rutland and Washington railroad of which he became president, treasurer and superintendent, and, shortly after effecting a consolidation of this road with the Rensselaer and Saratoga road, he removed to New York, opened a broker's office and began his campaign to gain control of the Erie Railroad. His manipulation of that stock in conjunction with James Fisk, Jr., was daring and unscrupulous and virtually wrecked the road to his own great financial profit. Still in accord with Fisk, he and his partner netted $11,000,000 by their scheme to corner the gold market of New York, which resulted in the financial crisis and panic known as 'Black Friday', (Sept. 24, 1869). He invested heavily in Pacific roads and by branch constructions and many consolidations established what is known as the Gould System. He was the principal figure in the formation of the Western Union Telegraph system in 1881 and in the same year gained control of the New York Elevated railroad.

GOUNOD, CHARLES FRANÇOIS (1819-93), Fr. composer; *b.* Paris; won *Grand prix de Rome*, 1839; studied sacred music in Rome, especially Palestrina and Bach; first opera, *Sappho*, 1851; *Faust*, 1859, most popular work and long the standard type of Fr. opera; *Philemon et Baucis*, 1860; *La Reine de Saba*, 1862; *Mireille*, 1864; *Romeo and Juliet*, 1867. G. wrote sacred music during the latter part of his life, two oratorios, *The Redemption* and *Mors et Vita*, being among his best works; a master of orchestration; romantic in style, with great dramatic passion.

GOURAUD, HENRI JOSEPH EUGÈNE (1867), Fr. soldier. His brilliant defense of the Argonne led to his being called 'the Lion of the Argonne.' He succeeded General d'Amade as commander-in-chief of Fr. Expeditionary Force at Dardanelles (May 1915), where he was severely wounded and lost an arm. In offensive in Champagne (July-Aug. 1918) defeated enemy E. of Reims; drove Germans out of Champagne and retook Mezières. He was given the rank of Marshal of France. In Dec. 1919 was appointed high commissioner of Syria and Cilicia, and the commander-in-chief of army of Levant. He took part as commander of a portion of the French forces in the occupation of the Ruhr in 1923.

GOURD, *monaecious* annual herbs, genus *Cucurbitae*, natural order *Cucurbitacea*, which trail by tendrils; showy yellow flower and large juicy fruits. The *Melon*, *Cucumber*, and *Vegetable Marrow* are cultivated for table use, while the *Colocynth* yields a purgative. The seeds of all have a destructive action on intestinal parasites. The shell of g. fruits are used as bottles, dippers, etc.

GOURGAUD, GASPARD, BARON (1783-1852), Fr. general; distinguished for personal devotion to Napoleon in wars, and voluntarily shared exile at St. Helena till jealousy of fellow-attendants caused departure; wrote *Campagne de 1815*, *Journal inedit de Ste. Helene*, etc.

GOURKO, BASIL, Russian soldier; was commander of 1st Cavalry Division at beginning of World War and fought on E. Prussian frontier. In Sept., 1916, became chief of imperial general staff. After revolution, March, 1917, was commander-in-chief of western armies. In June, 1917, he ceased to occupy his high position; later he was arrested by Provisional government, and finally banished from the country as a counter-revolutionary. He went to England, and pub. *Memories and Impressions of War and Revolution in Russia, 1914-1917*, 1918.

GOUT, constitutional disease characterized by inflammation of joints with deposition of biurate of soda and derangement of various internal organs, particularly the kidneys. The condition is due to excess of uric acid within the body, either through excessive consumption of nitrogenous matter or through deficient oxidation by the tissues and organs, accompanied by an obscure nervous disturbance. G. is hereditary and is influenced by over-indulgence in alcoholic beverages, particularly sweet wines and heavy malt liquors, or in rich foods, by sedentary occupations and

overwork, by certain poisons, such as lead, or by a combination of insufficient nourishment and bad hygiene.

GOVAN (55° 52′ N., 4° 19′ W.), town, Lanarkshire, Scotland, on Clyde; large shipbuilding yards; engineering works; locomotive manufactures; incorporated with Glasgow, 1912. Pop. 90,000.

GOVERNMENT, ruling authority in state; may also mean the person or persons to whom administration is entrusted and whose duty it is to deal with public affairs at home and to control foreign policy of state. Governments have been classified since the days of Aristotle as monarchical, aristocratic and democratic, but in view of modern developments a truer delineation would be *autocratic, constitutional,* and *popular.* The first of these, under which the monarch directs the lives of his subjects by the fiat of his word, finds no place in modern politics. *Constitutional* government arises where a community, which has formerly been ruled by a bureaucracy, has succeeded, without destroying the bureaucracy, in placing legal limitations upon the executive authority. Governments of this type are those of Spain and Italy, and that of Germany and the various Ger. states under the old regime. Under this system it invariably happens that the federal executive acts contrarily to the wishes of the government as a whole. The executive authority is bound by legal limitations, and by legal limitations only. Under the third type, the *popular* form of government, of which Great Britain, Belgium, and the Brit. Dominions are good examples, the executive exercises its undoubted legal functions according to the wishes of a body which may fairly be said to represent popular or public opinion. These countries are ruled by a nominal head under the title of king. The republic which is both theoretically and actually governed by the people has the United States for its chief example. All republics, including those established after the World War, are modeled after the principles upon which the United States was founded, and which are established in the Constitution. The machinery by which this harmony is achieved is usually that of a cabinet of ministers amenable to a popular chamber, which is itself amenable to a popular electorate. Into one of these three types of government all civilized systems will, it is believed, be found to fall. Government may also be classified according to the solidification or dispersion of ruling power, as centralized, dual, federal, and confederate; in a centralized government entire power is in the hands of the central administrative body, but in the other forms a considerable amount of authority is exercised by local governing bodies.

GOVERNOR, title of chief official of colony, generally also commander-in-chief; the g. represents Crown, and in colonies not possessing self-government has sole executive and sometimes sole legislative power. Canada, Australia, and South Africa have a governor-general; Australian states have gov's and lieut.-gov's; Canadian provinces have lieut.-gov's; S. African provinces have 'administrators.' In the United States the g. is the chief magistrate of a State, and is elected.

GOVERNORS ISLAND. A fortified island in New York Bay at the entrance to the East River. It takes its name from having been the residence of the colonial governors, the first being Wouter Van Twiller, 1637. In 1708 it was a quarantine station. Rumors of a war with France in 1794 impelled the state to give $500,000 for a fort and earthworks and Fort Jay, now Fort Columbus was built. Castle Williams dates from 1811, and in 1861-1865 was used as a prison for Confederates. The island is the headquarters of the Department of the East.

GOWER, JOHN (*d.* 1408), Eng. poet; was a person of means and influence; called by his friend, Chaucer, 'the moral Gower.' His Eng. poem, *Confessio Amantis,* consists of love stories and meditations. He also wrote in Latin, *Vox Clamantis,* dealing with the Peasants' revolt; and in Fr. *Speculum Meditantis,* a poem on married life.

GOWN (O. Fr. *goun*), outer garment without division for legs; now, except for clerical and academic g., appropriated to use of women, and known as dress or frock.

GOWRIE, JOHN RUTHVEN, 3RD EARL OF (1577-1600), Scot. noble; central figure of so-called Gowrie Conspiracy, a plot to seize and dethrone or assassinate James VI., who was lured to G.'s house in Perth on Aug. 5, 1600. G. and his younger *bro.,* Alexander Ruthven, were seized by the king's followers and slain on the spot.

GOWRIE, WILLIAM, 4TH LORD RUTHVEN, EARL OF (*c.* 1545-84), Scot. noble; joined his *f.* in murder of Rizzio, 1566; cr. Earl of G., 1581; led party in 'Raid of Ruthven,' whereby king was seized, 1582; executed.

GOYA (29° 12′ S., 59° 14′ W.), town, on Parana, Corrientes, Argentine Re-

public, S. America; pastoral district; commercial center. Pop. 7,000.

GOYA Y LUCIENTES, FRANCISCO (1746-1828), Span. artist; famed for portraits, including several Span. kings; also distinguished for genre pictures and etchings.

GOYANA, GOYANNA (7° 25′ S., 34° 48′ W.), city, Pernambuco, Brazil, S. America; active trade in sugar, coffee, cotton. Pop. *c.* 16,000.

GOYAZ (13° S., 48° W.), town and state, Brazil, S. America; between Minas Geraes and Matto Grasso; mountainous; traversed N. to S. by river Tocantius, the Araguay forming W., and Paranahyba S., boundary; extensive forests; chief occupation, agriculture and stock-raising; some tobacco cultivated and gold mined. Area, 266,000 sq. miles. Pop. *c.* 290,000. Town: pop. 14,000.

GOZO (36° 3′ N., 14° 14′ E.), island, in Mediterranean, belonging to Britain; 4 m. N. W. of Malta; ancient *Gaulos*. Area, 20 sq. miles. Pop. 18,000.

GOZZOLI, BENOZZO (*c.* 1420-98), Ital. artist of vast industry; pupil of Fra Angelico; principal work consists of series of frescoes illustrating Old Testament history, in the Campo Santo (Pisa), which occupied him for sixteen years.

GRAAFF-REINET (32° 16′ S., 24° 53′ E.), town, Cape of Good Hope province, S. Africa; founded by Cape Dutch, 1786; vineyards and orchards. Pop. 10,000.

GRACCHUS, plebeian Rom. family of *gens* Sempronia, of which most noted members were Tiberius Sempronius G. and Gaius Sempronius G., generally known as the *Gracchi*, sons of Tiberius Sempronius Gracchus, consul in 177 B.C., and his wife Cornelia (*q.v.*). Tiberius Sempronius (163-133 B.C.) fought under Scipio against Carthaginians; became tribune, 133, when he passed agrarian law, allotting public lands to the poor; killed with number of followers, by patricians headed by Scipio Nasica. Gaius (158-121 B.C.) became tribune, 123; introduced many reforms, passed corn law, and re-established agrarian law; while at Carthage, his reputation was undermined by enemies at home; on return, rejected for tribunate; escaped from ensuing riots, but was found dead next day; like his *bro.*, a lofty character, an ardent reformer, and a fine orator.

GRACE.—(1) The unmerited favor shown by God to man; (2) as means of salvation has become chief Christian symbol as opposed to works; (3) any favor or the disposition to favor; (4) permission; (5) a legal pardon; (6) attractiveness, virtue, charm; (7) musical: subsidiary embellishment, (*e.g.*) trills.

GRACE, DAYS OF, a certain number of days following the date specified on the face of a bill or note on which it becomes due. Until this period is expired, payment is not necessary. In the United States and Great Britain the usual time allowed is three days. Days of grace have been rescinded in some of the States.

GRACES, THE (classical myth.), were Aglaia, Thalia, and Euphrosyne, *dau's* of Zeus. They personified grace, beauty, and mirth; represented as three beautiful maidens with hands and arms intertwined.

GRACIÁN Y MORALES, BALTASAR, Span. author; the style of his prose allegory, *El Criticon*, has been much admired; Eng. trans. of his *The Art of Wordly Wisdom*, by Jacobs (1892).

GRACKLE (*Eulabes*), a genus of starling-like birds, differing from true starlings in their arboreal habits, their spotted eggs, and rictal bristles; inhabitants of South-Eastern Asia.

GRADISCA. See GÖRZ AND GRADISCA.

GRADO (43° 23′ N., 6° 8′ W.), town, Oviedo, Spain. Pop. 18,000.

GRADUATE, one who has passed the examinations of a recognized university for the degree of doctor, bachelor or master. Originally graduation was a license to practice a profession. Term 'Graduation' at times applied to prize-giving day in schools and colleges.

GRADUS AD PARNASSUM ('Steps to Parnassus'), dictionary of Latin prosody; an aid to Lat. verse-making.

GRADY, HENRY WOODFEN (1850-1889), American journalist and orator; *b.* in Athens, Georgia, *d.* in Atlanta. Graduated from the University of Georgia in 1868; two years at University of Virginia. He wrote for the Atlanta Constitution, edited the *Courier*, Rome, Georgia, and after failing to establish other papers, bought a quarter interest in the *Atlanta Constitution* in 1881, and was a part owner at his death. He made a great reputation as a correspondent and orator, and helped the north to understand the south. He aided in establishing the Confederate Veterans Home, and to organize the Atlanta Expositions in 1887-1889.

GRAETZ, HEINRICH (1817-91), Jewish historian; wrote *Geschichte der*

Juden (1853-75), best history of Jewish race; pioneer of higher criticism among Jews, but faithful to religion.

GRAEVIUS, JOHANN GEORG (1632-1703), Ger. scholar; Historiographer-Royal to William III. (of England); author of numerous works dealing with classical subjects.

GRAFFITI, name given by archæologists to chalk writings and rough drawings made on ancient buildings at Pompeii and elsewhere.

GRÄFRATH (51° 13′ N.; 7° 4′ E.), town, Rhineland, Prussia; steel and iron works. Pop. 12,000.

GRAFT, an American slang term for the act of any official or public employee who obtains money secretly or by virtue of his office: it is also applied to the gain thus procured.

GRAFTING, inserting buds or cuts (scions) from one plant (stock) within bark of another so that they unite; used to propagate plants not easily reproducible by seed.

GRAFTON.—(1) (29° 39′ S.; 152° 55′ E.), city, New South Wales, on Clarence; agricultural district; sugar-mills. Pop. 5150.

GRAFTON, a city of Massachusetts, in Worcester co. It is on the New York, New Haven and Hartford Railroad, 6 miles southeast of Worcester. The town contains several villages. There is a high school and a public library. Its industries include the manufacture of cotton goods, thread, shoes, soap and emery. Pop. 1920, 6886.

GRAFTON, a city of West Virginia, in Taylor co., of which it is the county seat. It is on the Baltimore and Ohio railroad, and on the Tygart's Valley river. The city is an important railroad center and is the terminus of four divisions of the Baltimore and Ohio railroad. It has extensive industries including railroad shops, and plants for the making of flour, machinery, cigars, etc. It is the distributing point for the wholesale grocery trade for the surrounding country. Within the border of the city is a national cemetery. Pop. 1920, 8,517.

GRAGNANO, town, 20 miles S.E. Naples; trade in wine and macaroni. Pop. 10,000.

GRAHAM, SIR GERALD (1831-99), Brit. gen.; distinguished himself in Crimean and China Wars (1860); commanded in Egyptian War at *Tel-el-Kebir*; wrote *Last Words with Gordon*, and other works.

GRAHAM, HENRY TUCKER (1865), college president. Graduated from Hampden-Sidney College in 1886 and Union Theological Seminary, Richmond, Va., in 1891. Ordained Presbyterian minister in 1891. Spent five years as missionary in Japan. Became president of Hampden-Sidney College in 1908, serving until 1917. Since then pastor Presbyterian Church in Florence, S.C. Author of *John Randolph of Roanoke*; *An Old Manse*; *Stonewall Jackson*; *The Christian*. Has written extensively for theological papers and magazines.

GRAHAM, SIR JAMES ROBERT GEORGE, Bart. (1792-1861), Brit. statesman; an advanced Liberal, and supporter of the Reform Bill; Home Sec. under Sir Robert Peel (1841-46); First Lord of Admiralty under Aberdeen and Palmertson.

GRAHAM, JOHN. See DUNDEE, VISCOUNT.

GRAHAM, SYLVESTER (1794-1851), Amer. food reformer; advocate of temperance reform and vegetarianism; introduced 'Graham bread,' made from unbolted flour, and drew up a dietarian and physiological regimen which had many supporters.

GRAHAM, THOMAS (1805-69), Brit. physicist and chemist; appointed Master of the Mint, 1855. His chief researches concerned molecular physics, the absorption of gases by liquids, and the diffusion of gases. He divided substances into crystalloids and colloids, and investigated their behavior towards membranes. He discovered polybasic acids, and obtained three acids from phosphorous anhydride.

GRAHAME, KENNETH (1859), Brit. author; *b.* at Edinburgh, Scotland, in 1859. His best known publications are *Pagan Papers*, 1893; *The Golden Age*, 1895; *Dream Days*, 1898 and *The Wind Among the Willows*, 1908.

GRAHAME-WHITE, CLAUDE (1879), Brit. aviator and aeronautical engineer, originally a pioneer of petrol-driven car, was first Englishman to obtain aviator's certificate; afterwards established a flying school at Pau, 1909. After outbreak of World War he was appointed flight-commander on special service in R.N.A.S., but resigned, with approval of Admiralty, to carry out government contracts for aircraft. He has written many books on aviation, including *Aircraft in the Great War*, *Air Power*, etc., and also several boys' stories.

GRAHAM'S LAND, Antarctic district (56° to 57° W., 65° to 67° S.), discovered 1832.

GRAHAMSTOWN (33° 13′ S., 26° 32′ E.), city, Cape Province, S. Africa; educational center; seat of Anglican and R.C. bp's; agricultural and pastoral district; wool industry. Pop. 14,000.

GRAIL, THE HOLY, a miraculous vessel, which formed subject of many mediæval romances; in most versions of the legend it was a cup sent from heaven, and used by Christ at Last Supper, afterwards coming to possession of Joseph of Arimathea, who collected the Lord's blood in it; on death of Joseph, the grail was taken back to heaven, to be kept there until a hero worthy of it should appear on earth. It enters into the legend of King Arthur and the knights of the Round Table, many of whom, including Galahad, Perceval, and Gawain, set out in quest of it.

GRAIN includes wheat, barley, oats, and various other cereal food-stuffs. Of these wheat is the most important, and its cultivation dates back to remote times. Oats, an important article of food for animals, are largely used in the form of oatmeal for human consumption; and barley, also a cattle-food, is extensively employed in manufactured products. Wheat is grown both in cold and hot climates.

GRAIN ELEVATORS, warehouses for the storage of grain. These buildings are especially adapted for the storage of the various grains, especially wheat, in bulk, resembling large tanks, from which the grain is drawn as though liquid through large pipes into the cars when being loaded for shipping. The grain elevator may be called a peculiarly American institution, being first employed in this country in the Middle West shortly after the wide prairies were first planted with grain, and following this development westward. It is especially significant in an economic sense; for it is about the grain elevator that the struggle between the producer and the speculating grain merchants has centered. It was in the late seventies and the early eighties that the farmers began realizing that certain private individuals and corporations had been erecting great lines of grain elevators along the railroads. The owners of these warehouses were in close touch with the banking interests and the railroads. By combinations among these middlemen, vast quantities of grain were cornered by them in storage, with the result that prices could be artificially stimulated after the grain had left the hands of the producers. The grain elevator was found to be the strategic point in these operations. Realizing this, the more intelligent grain producers have emphasized the importance of the elevators being owned and controlled by themselves. Thus organizations of farmers have been formed in the principal grain producing states with the object of erecting their own storage plants, enabling them to retain possession of their produce until the rise in prices. In the two Dakotas and in parts of adjoining states a movement is established having for its object the ownership of grain elevators by the state governments. In North Dakota it was this appeal especially which brought the Non-Partisan League temporarily into power. Government ownership of grain elevators has, however, not proven a success. The newly organized Grain Growers Association emphasizes the co-operative ownership of the elevators by the growers themselves, and will establish this principle on a nationwide basis.

GRAIN PRODUCTION, the growing of those seeds which are utilized as food products, including wheat, corn, rye, barley, oats, and even buckwheat, though botanically the latter is not properly a grain. The production of grain has, naturally, been most extensively developed in the countries with broad, open plains, such as Russia, Canada, Argentina and the United States, rendering other countries economically dependent upon them to a certain extent. Since the World War, Russia has, at least temporarily, been eliminated from this class. In consequence the European countries are proportionately more dependent on Canada, Argentina and especially the United States, for their supply of cereals. In this country the grain crops are by far the most important in all agricultural production, the value of our cereal crops in 1919 being almost $7,000,000,000, as compared to $14,755,000,000, the total value of all crops, being very little short of half. Of all our grain crops, corn stands forth as the most important, over 100,000,000 acres being devoted to corn as compared to 56,770,000 acres devoted to wheat in 1922 and a little over 73,000,000 acres in 1919, which was the year of largest wheat production in the history of the country. The value of the corn crop in 1922 was $1,800,000,000, as compared to $720,000,000, the value of the wheat crop in the same year. In quantity the comparison was 818,000,000 bushels of wheat to 2,875,000,000 bushels of corn, being over three times as much corn as wheat. Oats rank third in importance; in 1922 nearly 42,000,000 acres were devoted to oats, the crop

being valued at $404,000,000, and the amount being 1,255,000,000. Thus, in quantity oats were ahead of wheat, but in value considerably less. Barley is the fourth most important crop. In 1922 the crop amounted to 194,000,000 bushels, valued at $88,500,000. In the same year the rye crop amounted to 79,600,000 bushels, valued at $50,300,000. To what extent these gigantic crops of grain constitute a surplus above domestic needs may be judged from the fact that in 1922 the exports of these commodities were as follows: wheat, 208,000,000 bushels; corn, 176,500,000 bushels; oats, 15,760,000 bushels; rye, 30,000,000 bushels; and barley, 22,400,000 bushels. It will be noted that though our corn crop is so much larger than the wheat crop, the surplus is less, corn being very much less used as a human food product in Europe than in the United States. One of the most important factors tending to increase grain production in the United States was the organization, in 1921, of the United States Grain Growers, Inc., an association of the growers of grain for the purpose of marketing their product co-operatively. The purpose is to take the grain trade out of the hands of commission merchants, boards of trade and grain speculators generally, and place these commodities directly on the market, where they will be immediately available to the consumers. Over 30,000 producers have already joined the association, covering about 50,000,000 bushels of grain.

GRAINGER, PERCY (ALDRIDGE), (1882), musical composer. Studied at home and under Professor Kwast in Frankfort-on-the-Main. Made debut as pianist at 10 years of age, touring Europe, Australia and South Africa. Came to the United States in 1914 and since then has toured the country from coast to coast. Was a specialist in folk-music and has made more than 500 phonographic records. Composer of over 70 works for piano, orchestra, chamber music, etc. His best known compositions include *The Sussex Mummers Christmas Carol*; *Country Gardens*; *Children's March*; *The Sprig of Thyme*; *British Waterloo*; *The Pretty Maid Milking Her Cow*, etc.

GRAMMAR consists of a code of laws to which the usage of the best writers of an age and language conforms. G. is not a static thing. Speech varies in different areas and in different periods, and the only pattern or standard available is the usage of the best writers and speakers. One language may have very many dialects. Each *dialect* will have an independent g., but in such cases one dialect is usually preferred because it is employed at the court or in the chief univ., or is represented, by the finest body of lit. There is, however, a possibility and a probability that the usages of the other dialects may become standard, because it is from the so-called dialect sources that the approved speech is for the most part replenished and renewed. Such growth, therefore, implies various transition stages when alternative forms exist side by side, and time only (and not the grammarian) can choose between them.

Only by patient study of the evolution and development of forms can the seeming irregularities and anomalies of g. be understood. G. falls into two broad divisions—(1) Morphology, which deals with the form, structure, and inflections of words; (2) Syntax, which deals with the arrangement of proper word-forms in groups and sentences. Morphology is concerned with the classification of stems and the classification of inflections. Inflections designate relations to other words in the group (*e.g.*) case, or qualify and limit the meaning of the word (*e.g.*) gender. Languages vary greatly in the number and kind of inflections. Inflections themselves belong to a more or less advanced stage in a language development. *Comparative* g. is necessary for the proper appreciation of the individual systems.

GRAMME, see WEIGHTS AND MEASURES.

GRAMMICHELE (37° 12′ N.; 14° 39′ E.), town, Catania, Sicily. Pop. 15,000.

GRAMONT, ANTOINE AGÉNOR ALFRED, DUC DE (1818-80), Fr. statesman and diplomat; ambassador to Italy, 1857; Austria, 1861; Foreign Minister, 1870; had considerable share in causing outbreak of Franco-German War; wrote *La France et la Prusse avant la Guerre*.

GRAMONT, PHILIBERT, COMTE DE (1621-1707), Fr. courtier; famed for his handsome person, wit, and gallantries; served under Condé and Turenne; favorite of Louis XIV; later exiled, he appeared at the court of Charles II. of England. His *Memoires*, is a Fr. classic.

GRAMOPHONE, a machine capable of recording sounds such as human speech, music, etc., in such a manner that they can again be reproduced at will, by the same machine which made the record, or one similar to it. It was

invented by Emile Berliner, at Philadelphia, Pa., in 1888, and consisted of a cylinder with its axis horizontal, rotating at a constant speed, over which was placed a hollow cylinder of wax or similar substance; this was the blank or 'record.' A sharp steel stylus, fastened to a thin diaphragm rested against the cylinder and was moved forward at a constant rate so as to scribe a helix on the wax cylinder. A horn terminated in a small chamber in which the diaphragm was placed. Any sound produced in front of the bell of the horn was concentrated in the diaphragm chamber and caused the diaphragm to vibrate in accordance with the sound waves. This vibration was transferred to the stylus, thus resulting in the production of a groove of varying depth on the record. If after finishing the record, the stylus was again run through the same groove, its varying depth caused the stylus and its connected diaphragm to vibrate, and the original sounds were faithfully reproduced. This device has been highly perfected by various companies. Phonographs are now sold under many names. Superficially these products do not resemble the original gramophone, but the principle of operation is the same. The same principle is used in the Dictograph. See DICTOGRAPH. The most radical improvement made has been in the records; many of those now in use are discs, although some cylinders are still used (as in the dictograph). The records are of hard, wear-resisting material and are made by a highly developed and accurate system. See TALKING MACHINES.

GRAMPIANS, THE (56° 50′ N., 4° W.), mountain range, Central Scotland, stretching N.E. to S.W. from counties of Banff and Aberdeen to Argyll and Dumbarton; highest summit, Ben Nevis, 4406 ft.

GRAMPUS (*Orca gladiator*), often called the 'killer whale,' is a large member of Dolphin family, sometimes attaining 30 ft. in length; color is black, with white underparts, and a white streak above and behind eye, and dorsal fin is very high; is the fiercest and most voracious member of Dolphin family, and is found chiefly in northern waters.

GRAN CHACO, EL (25° S., 60° W.), extensive region, Argentine Republic, S. America, comprising Bolivia, Paraguay, Argentina, and Brazil; traversed by Pilcomayo, Bermejo, and other affluents of Paraguay; surface mostly flat, with sandy deserts and large tracts of forest; portions subject to periodical inundations; thinly populated by nomadic Indian tribes.

GRAN SASSO D'ITALIA, MONT CORNO (42° 27′ N., 13° 40′ E.), highest group of Apennines; highest summit, 9585 ft.

GRANADA (12° N., 85° 56′ W.), city, Nicaragua, Cent. America, on Nicaragua Lake; manufactures goldwire chains; exports indigo, hides, cocoa, coffee. Pop. 1920, 21,925.

GRANADA (37° 13′ N., 3° 41′ W.), town, Andalusia, Spain; capital of province G.; splendidly situated at base of Sierra Nevada on Darro and Genil. Outstanding features are the Alhambra Alcazabar (citadel), on strongly fortified eminence; Generalife (summer residence of Moorish kings); fine Gothic cathedral (1528), Segrario, with royal mausoleum; monastery of St. Jerome (1492), univ. (1531), and many old interesting houses. G. was founded VIII. cent.; capital of Moorish kingdom, and great trading and artistic center in XIII. cent.; last Moorish stronghold in Spain; taken by Spaniards, 1492. Pop. 1918, 77,477.

GRANADA (37° 30′ N., 3° W.), maritime province, S. Spain, formed from part of ancient Moorish kingdom of Granada; generally mountainous, traversed by Sierra Nevada; fine fertile valleys and plains; rich in minerals; produces wheat, barley, wine, sugar, fruit; area, 4928 sq. miles. Pop. 1920, 545,217. Capital, Granada, has a univ. Pop. 77,477.

GRANADA, LUIS DE (1504-88), Span. theologian; provincial of Dominicans in Portugal; a mystical thinker, he was suspected by the Inquisition and his works put on the Index.

GRANBY, JOHN MANNERS, MARQUESS OF (1721-70), Eng. soldier; commanded Brit. troops in Germany, 1760-63; commander-in-chief, 1766.

GRAND ARMY OF THE REPUBLIC. A patriotic association made up of surviving soldiers and sailors of the Civil War and of the militia on active duty in that period and subject to the national call. The association was organized in Chicago in the winter of 1865-1866 by Dr. B. F. Stephenson, the surgeon, and Rev. R. W. J. Rudolph, the chaplain, of the 14th Illinois Infantry. The first post was organized at Decatur, Illinois, April 6, 1866 and the first National Encampment was held at Indianapolis, November 20, 1866. The main purpose of the association is to help the families of dead comrades, caring for their orphans, establishing soldiers homes, and to

secure adequate pensions. In 1869 the association ruled against partisanship in political nominations, etc., but this has not always been observed. The G.A.R. exercises a notable influence in all elections and its favor is eagerly sought by the leading parties. In 1920 the membership was 103,258. Headquarters in 1922, Cincinnati. Commander-in-chief, Judge J. W. Willett, Tama, Ohio. Surgeon-General, Dr. George T. Harding, Marion, O., and Chaplain-in-chief, Rev. J. H. Eppler, Gary, Ind.

GRAND CANYON, term applied to that portion of the Canyon of the Colorado River that lies in northern Arizona. It is far remote from civilization and can be reached only by means of a branch road of the Atchison, Topeka and Santa Fe Railroad. It is one of the most striking natural wonders on the American continent. It has a depth of nearly a mile and a width ranging from 8 to 10 miles. The scenery it affords is rugged and majestic beyond description. The cliffs are of limestone and sandstone with some intervening shales of softer material. The rocks have almost all the colors of the spectrum, and under the influence of sun and shadow form pictures of entrancing beauty beyond the imagination of a dreamer or the brush of an artist. The Colorado River as it rushes through the Grand Canyon is about 300 feet wide, and in time of freshet forms a mighty torrent. Rain and wind have sculptured the cliffs into bewildering and fantastic forms, which, added to by their brilliancy of coloring, make them a stupendous natural spectacle.

The Canyon was first seen by white men in 1541, when Hopi Indians guided Cardenas and his companions to the rim. In 1869 the river through the Canyon was traversed for its entire length by Major Powell, to whom the Government erected a memorial in honor of the exploit. The Grand Canyon is now included in a forest reserve under the supervision of the U.S. Department of Agriculture.

GRAND-DUKE, title dating from the XVI. cent., at present borne by several European rulers. It is also given to the nearest relatives and the children of the Czar of Russia.

GRANDEE, title borne by Span. nobles of the highest rank. Formerly the title carried special privileges.

GRAND FORKS, a city of North Dakota, in Grand Forks co., of which it is the county seat. It is on the Great Northern and Northern Pacific railroads, and on the Red River of the North. The industries include flour and lumber mills and it has large agricultural and lumbering interests. The city is the seat of the University of North Dakota, Grand Forks College, and St. Bernard's Academy. Pop. 1920, 14,010.

GRAND GULF, a locality in Mississippi, on the Missouri River, south of Vicksburg. Here, on March 31, 1863 the Confederate batteries were attacked by the Union fleet under Admiral Farragut, and after a severe bombardment which lasted until May 3, the forts surrendered to the naval forces and to the land forces under Generals Grant and Porter.

GRAND HAVEN, a city of Michigan, in Ottawa co., of which it is the county seat. It is on the Grand Trunk, Grand Haven, and Muskegon, and the Pere Marquette railroads, and at the mouth of the Grand River. The city is a port of entry and has an excellent harbor. It is connected by steamship lines with the chief lake ports. The surrounding country is an important fruit and celery growing region and is the center of an important trade in these products. It has also large fishing industries. Its industries include the manufacture of engines, printing presses, baskets, barrels, shoes, etc. There is a public library, a United States custom-house, and a county court-house. The city is the seat of Akeley College for girls. In the neighborhood are Highland Park and Spring Lake, which are popular summer resorts. Pop. 1920, 7,224.

GRAND INTERNATIONAL BROTHERHOOD OF LOCOMOTIVE ENGINEERS. See BROTHERHOODS, RAILROAD.

GRAND ISLAND, a city of Nebraska, in Hall co., of which it is the county seat. It is on the Union Pacific, the Burlington Route, and the St. Joseph and Grand Island railroads. It is important industrially and has a beet sugar factory, a cement block factory, candy factory, wire factories, broom factories, etc. It has also the railroad shops of the Union Pacific railroad. There is a public library and a hospital. The city is the seat of the Nebraska Soldiers' and Sailors' Home, and Grand Island College. Pop. 1920, 13,960.

GRAND JUNCTION, a city of Colorado, in Mesa co., of which it is the county seat. It is on the Denver and Rio Grande, the Colorado Midland, and other railroads, and at the junction of the Grand and Gunnison rivers. The surrounding country is an agricultural and fruit growing region and in the neighborhood are important coal mines.

The industries include machine shops, lumber yards, railroad shops, brick works, and a beet-sugar factory. There is a public library among its public buildings. Pop. 1920, 8,625.

GRANDMONTINES, order of hermits (living much like the Camaldolese, *q.v.*) founded by St. Stephen of Thiers (XI. cent.); named from Grandmont, near Muret, where large monastery was founded; order ceased XVIII. cent.

GRAND PRÉ, or **LOWER HORTON.** (1) A post vil. in Nova Scotia, situated in King's co., 15 m. from Windsor. Stands in the midst of very fertile country. Has been made famous as the scene of Longfellow's poem *Evangeline.* Pop. 900. (2) A French tn. in the Ardennes. Notable for severe fighting during the World War.

GRAND RAPIDS, a city of Michigan, in Kane co., of which it is the county seat. It is on the Pere Marquette, the Michigan Central, the Lake Shore and Michigan Southern, and other railroads, and on both sides of the Grand River, 60 miles northwest of Lansing. The city has direct steamboat communication with Chicago, Milwaukee and other cities. It is the second city of the State in population and commercial importance. The Grand River, which at this point has a fall of 18 feet, supplies excellent water power for the important industries, which include the manufacture of furniture, bicycles, brass goods, flour, brushes, carpet sweepers, refrigerators, etc. Grand Rapids is noted for the manufacture of furniture of all kinds. Gypsum quarries in the neighborhood have the largest output in the world. The city is well laid out and has an excellent system of streets. The notable buildings include a city hall, St. Cecelia and Peninsular Club Houses, Pythian Temple, Federal building, county building, Y. M. C. A. building, and many churches. There are also many handsome business blocks and private residences. There is an excellent school system with a Central High School. Among the public institutions are the Michigan State Soldiers' Home, Union Benevolent Home, Masonic Home and Catholic Home. There is a splendid system of pleasure grounds and public parks. Grand Rapids was founded in 1833 on the site of an Indian village, and was incorporated as a city in 1850. Pop. 1920, 137,634.

GRAND RAPIDS, a city of Wisconsin, in Wood co., of which it is the county seat. It is on the Chicago, Milwaukee and St. Paul, the Minneapolis, St. Paul and Sault Ste. Marie, and the Chicago and Northwestern railroads, and on the Wisconsin river, which here is spanned by a fine bridge. The industries of the city, which are important, include foundries and machine shops, and plants for the making of paper, furniture, wagons, flour, etc. The river furnishes excellent water power. The public buildings include a hospital, library, and there are also several parks. Pop. 1920, 7,243.

GRANDSON, GRANSON (46° 49′ N., 6° 38′ E.), town, Swiss canton Vaud, on Lake Neuchâtel; scene of defeat of Charles the Bold by Swiss. 1476.

GRANGEMOUTH (56° 2′ N., 3° 45′ W.), seaport town, Stirlingshire, Scotland, on Firth of Forth; large docks, shipbuilding yards; exports coal, iron. Pop. 10,000.

GRANGER, JAMES (1723-76), Eng. biographer; vicar of Shiplake (Oxon); wrote *Biographical History of England,* in which portraits were first introduced; hence 'to Grangerise' is to insert illustrations from other books.

GRANGERS or **GRANGES,** nickname of an agricultural association founded in America, 1867, for farmers' education and co-operation. See Husbandry Patrons of.

GRANITE, unstratified rocks, composed of quartz, felspar, and mica, occurring in masses. G's are the most abundant of igneous rocks, and have been subjected to great pressure; they belong to various periods, ranging from the pre-Cambrian to Tertiary. They vary in hardness and color according to their composition.

GRANITE CITY, a city of Illinois, in Madison co. It is on the Chicago and Alton, the Chicago, Peoria and St. Louis, the Cleveland, Cincinnati, Chicago and St. Louis, and other railroads. The city is opposite St. Louis, Mo. It has great industrial importance and has manufactures of iron, steel plate, and granite ware. It has also a large corn products refinery and bridge works. There is a public hospital. Pop. 1920, 14,757.

GRANT, ETHEL WATTS-MUMFORD, an American author. Studied art at Julien Academy, Paris. Took up writing in connection with illustration and travel sketches. Her writings include *Whitewash,* 1903; *The Cynic's Calendar; A Joke-Book.* 1904; *The Hundred Love Songs of Kamal,* 1905; *Out of the Ashes,* 1913; *The Grim 13,* 1917; Her plays are *Good Night Nurse; The Scenario; Sick-a-Bed; Easy Money;*

It Pays to Smile, from story by Nina Wilcox Putnam; *The Wedding Song*, and others.

GRANT, FREDERICK DENT (1850-1912), an American soldier, *s.* of Ulysses S. Grant; *b.* St. Louis, Mo. He served in the Civil War, rising to the rank of colonel, and at its close entered West Point, graduating in 1871. He resigned from the army in 1881. He served as minister to Austria and was police commissioner of New York from 1894 to 1898. At the outbreak of the Spanish-American War he was made brigadier-general of volunteers. He continued service in the regular army and commanded in the Philippines and several departments in the United States. He was made a major-general in 1906.

GRANT, GEORGE MUNRO (1835-1902), Canadian educationist; principal of Kingston Univ. (Ontario); author of *Ocean to Ocean, Our National Objects and Aims.*

GRANT, JAMES (1822-87), a British novelist, *b.* at Edinburgh. He was taken to Newfoundland when a boy, but returned at the age of seventeen and entered the army. After four years' service he resigned and took up literature instead. In 1846 he published the *Romance of War*, which gained some reputation for him. In 1875 he was received into the communion of the Roman Church. Amongst his works are *Adventures of an Aide-de-Camp*; *Frank Hilton*; *Bothwell*; and *Old and New Edinburgh.*

GRANT, PERCY STICKNEY (1860), American clergyman. Graduated at Harvard in 1883 and from the Episcopal Theological School in 1886. Ordained in 1887. Held various charges in Fall River and Swansea, Mass. Since 1893 rector of Church of the Ascension, New York City. He was noted for his independence on theological subjects. Conducted an open forum for public discussion of questions of the day. Author: *Ad Matrem*, 1905; *The Search of Belisarius*, 1907; *Socialism and Christianity*, 1910; *The Return of Odysseus*, 1912; and *Fair Play for the Worker*, 1918.

GRANT, ROBERT (1852), American jurist and novelist. *b.* in Boston. Graduated from Harvard 1873 and the Law School 1879; appointed judge of probate and insolvents for Suffolk county in 1893. A member of the American Academy of Arts and Letters. Publications *Little Tin Gods on Wheels*; *Confessions of a Frivolous Girl*; *Unleavened Bread*, 1900; *The Law Breakers*, 1906; *The Chippendales*, 1909; *The High Priestess*, 1915; *Law and the Family*, 1919.

GRANT, ULYSSES SIMPSON (1822-1885), American soldier and 18th President of the United States. *b.* at Point Pleasant, Ohio, *d.* at Mount MacGregor near Saratoga Springs. Of Scotch ancestry his grandfather Noah Grant was a soldier in the Revolution. He was the oldest of six children born to Jesse Root Grant and Hannah Simpson, and named Hiram Ulysses but having been designated as Ulysses Simpson in his appointment to the U.S. Military Academy he retained that name. Having obtained a good common school education he entered the U.S. Military Academy in 1839 and graduated in 1843, and was assigned to the Jefferson barracks in Missouri. In 1844 he accompanied the 4th Infantry to Louisiana and appointed 2nd lieutenant. Joined General Zachary Taylor's army in occupation the next year. In the Mexican War he fought in the battle of Palo Alto and was present when Monterey fell. The 4th Infantry having joined Gen. Scott, the young lieutenant went through the successful campaigns that terminated with the capture of the City of Mexico. He was made 1st lieutenant and captain for bravery at Molino del Rey and Chapultepec. Returning to the United States in 1848 Grant married Miss Julia B. Dent of St. Louis. Three sons and a daughter were born to them, the eldest being Frederick Dent Grant (*q.v.*). In 1854 Grant resigned from the army and tried various occupations as farmer, real estate agent, and lastly as a clerk in his father's leather store in Galena, Ill. At the beginning of the Civil War he offered his services to the Government by letter and received no reply. Having raised and drilled a company at Galena he was made a mustering officer and then Colonel of the 21st Illinois Infantry Volunteers (June 17, 1861). Assigned to a military district under Fremont in Missouri his command included western Kentucky and southern Illinois. His first act was to seize Paducah, Ky., and with 3000 men on transports from Cairo he made a demonstration against Belmont, Mo., to hold the Confederates at Columbus, Ky., from reinforcing General Price in Missouri. In February 1862 with gunboats under Commodore Foote attacks were made on Forts Henry and Donelson. Foote captured Fort Henry and February 16, Grant took Fort Donelson, for which he was promoted Major-General. With Halleck's army he fought at Shiloh and helped to drive the Confederates out of Corinth. Halleck

having been appointed commander-in-chief of all the Federal armies, Grant succeeded him in the field. In October 1862 he commanded the Dept. of Tennessee and the army of Mississippi which captured Vicksburg July 4. In the battle of Chattanooga, November 23-25, Grant defeated General Bragg and received the thanks of Congress and a gold medal. The rank of Lt.-General was revived for him in March, 1864. He had control now of all armies of the United States. Sherman commanded all troops west of the Alleghenies and north of Natchez. Grant's army between Washington and Richmond had for its objective Lee's Northern Army of Virginia. The Battles of the Wilderness and Spottsylvania Court House were Federal victories but June 3, Grant's troops were repulsed with great slaughter at Cold Harbor. The capture of Petersburg was followed by the siege and fall of Richmond and April 9, 1865, Lee surrendered to Grant at Appomattox Court House. By a special Act of Congress Grant was appointed General July 25, 1866. He was nominated for President by the Republicans in 1868 on the first ballot. In the election Grant had 214 electoral votes to 80 for Seymour. He was renominated and re-elected in 1872 defeating Horace Greeley. Grant's administrations were notable for reduction of public debt; treaty with England in 1871; settlement of the Canadian boundary and fisheries question, the 15th Amendment to the Constitution; commercial treaty with Mexico, etc. General Grant made a trip around the world in 1877-1879. At the Republican Convention in 1880 he led for 36 ballots, when Garfield was named. In the same year Grant became a partner in a brokerage firm in New York and was victimized by his partner who was sent to prison. Congress restored him to the army in 1885 with rank of General and retired. His last years were spent on his *Memoirs* for which the public paid $500,000. Cancer of the throat from which he had long suffered led to his death in July 1, 1885. A stately tomb on the Hudson, at New York marks his resting place.

GRANTH, sacred writings of Sikhs; name derived from Sanskrit word *grantha*, 'a fastening together'; originator of Sikh religious sect was Baba Nanak, a Hindu, whose writings are contained in the *Adi Granth Sahib*, a compilation made by Guru Arjan, and written in various dialects.

GRANTHAM (52° 55′ N., 0° 39′ W.), market town, Lincolnshire, England, on Witham; fine XIII.-cent. church; in grammar school Newton was ed. in vicinity, on May 13, 1643. Cromwell won his first victory over Royalists; iron manufactures. Pop. 1921, 18,902.

GRANULATION, the act of forming into grains. The process by which a metal is reduced into grains is brought about by melting the metal and then pouring it in a thin stream into cold water. The metal divides itself into grains which are each practically perfect spheres. Metals which are easily melted are often poured in a molten state into a wooden box and violently shaken. This results in the metal granulating into much finer portions.

GRANULITE (Lat. *granulum*, a little grain), name of two classes of rocks of granite class and of same family as gneiss. Muscovite and biotite freely occur in g., but as a rule it is composed mostly of quartz feldspar. G. often contains small garnets.

GRANVILLE. (1) (48° 51′ N., 1° 37′ W.), fortified seaport, seaside resort, Manche, France; deep-sea fisheries; shipbuilding; active trade; unsuccessfully besieged by the Vendeans in 1793; by British in 1803. Pop. 12,000.

GRANVILLE, GEORGE LEVESON-GOWER, 2ND EARL (1815-91), Brit. politician; M.P. for Morpeth, 1836; Foreign Under-Sec., 1840; held office in all Liberal governments till 1886; promoted exhibition, 1851; Colonial Sec., 1868; Foreign Sec., 1870-74, 1880-85. Liberal leader in Upper House for many years.

GRANVILLE, JOHN CARTERET, EARL (1690-1763), Eng. politician; supported George I. against Jacobites; ambassador to Sweden, 1719; Sec. of State, 1721; Lord-Lieut. of Ireland, 1724-30; secured recall of patent for 'Wood's halfpence.' Sec. of State, 1742-44; formed ministry with Lord Bath which lasted two days, 1746; Pres. of Council, 1751-63.

GRANVILLE, WILLIAM ANTHONY (1863), college president. Graduate of Sheffield Scientific School, Yale, 1893. Served as instructor of mathematics at Yale from 1895 to 1909. Elected President of Pennsylvania College, Gettysburg, Pa., in 1900. Author of the following text books: *Differential and Integral Calculus*, 1905; *Plane Trigonometry*, 1909; *Special Trigonometry*, 1909; *Elementary Analysis*.

GRAO (39° 30′ N., 0° 19′ W.), town. Valencia, Spain. Pop. *c.* 6000.

GRAPE. See VINE.

GRAPE FRUIT. See SHADDOCK.

GRAPE SUGAR. See GLUCOSE.

GRAPHITE, also called plumbago (Lat. *plumbum,* lead) and blacklead, a form of carbon and one of softest of minerals, occurring in older crystalline rocks such as gneiss and schist, and found in great purity in Burrowdale, Cumberland, also in Canada and Bohemia. Color is iron grey. G. is used for pencils, giving a smooth surface to casting moulds and lubrication.

GRAPHOPHONE. See GRAMOPHONE.

GRAPHS, diagrams, generally drawn for convenience on squared paper, which are intended to illustrate or prove a calculation or an array of facts. For instance, if a table showing the average height of a number of men was required, the simplest form would be a g. with the number of men of similar height arranged in ascending order on the side line with a scale in inches marked along the base. G's of this kind take the form of a tall curve narrowing as it ascends and generally symmetrical; the normal variability curve is of this type. G's are also employed in marking contour lines, barometric conditions, and for temperature charts, while their service is widely employed in math's, especially in Algebra.

GRAPTOLITES, an order of extinct *Hydromedusae,* occurring in the Lower Palæozoic rocks; believed to be related to existing *Calyptoblasts,* though differing in important details. The harder parts alone remain to us, and these, when preserved in the original condition are found to consist of *chitin.*

GRASLITZ (50° 21′ N., 12° 27′ E.), town, Czecho-Slovakia; manufactures cottons and laces, upholstery. Pop. 13,000.

GRASMERE (54° 27′ N., 3° 1′ W.), lake, Westmoreland, England; 1 mile long; also village on lake, associated with Wordsworth, De Quincey, and Coleridge. Pop. 900.

GRASS. The presence of grassland depends not so much on soil as on rainfall. Grasses have shallow roots and require frequent showers during their growing season. The earth is naturally divided into *woodland, desert,* and *grassland,* but an increase of pasture at the expense of woodland may spoil the pastures of a locality. Nearly all pastures are sown with mixed grasses. Of these *Phleum pratense* (timothy grass) is cheap, and used for crops of more than one year's duration. *Lolium perenne* (perennial rye-grass) is cheap, and very popular. *Alopecurus pratensis* (meadow fox-tail) is expensive, and therefore often adulterated.

Grasses are herbaceous *monocotyledonous* plants with jointed stems, hollow except at the bases of the leaves. They belong to the natural order *Tramineae,* which includes *cereals, grasses,* and *bamboos.* The *embryo* has one *Cotyledon,* which remains behind in the seed-coat to absorb the *endosperm.* The primary root is soon replaced by other roots from the base of the stem. The long, narrow leaves are parallel-veined and have long membraneous sheaths, which enclose the stem, being split on the side opposite the leaf-blade. The leaves are arranged in two opposite series. In the buds the leaves may be rolled or folded. The flowers are arranged in *spikelets* (*i.e.* are borne on the axis without stalks). These may be grouped together in various ways. If the *spikelets* are borne on branches of the main axis the *inflorescence* is a *panicle,* which is loose as in the *oat,* or close and cylindrical as in the *fox-tail* grass. In the *wheat* the *spikelets* form a compound *spike.* The number and character of the flowers in a *spikelet* vary, and the sepals and petals are absent or scaly. The *spikelet* bears a number of scales in two rows; the two basal scales have no flowers, and are called *glumes.* The other scales represent *bracts* and carry flowers in their axils. They constitute the lower or outer *palae* or *flowering glumes.* A long process, the *awn,* is sometimes carried by the lower *palae.* Above the lower *palae* is the flower, above which there is a scaly *bracteole* called the *upper* or *inner palae.* The flower has three or two *stamens* inserted below the *pistil* and borne on long, slender filaments. The *anthers* are versatile. The *pistil* consists of one *carpel* bearing two feathery *stigmas,* and the *ovary* contains one *ovule.* The fruit is a *caryopsis* (*i.e.*) has the seed-coats and fruit-wall fused together, while the seed is *albuminous.* Two little scales, *lodicules,* are found at the base of the ovary. The *stigma* ripens first and the wild grasses are cross-fertilized, but the cultivated *cereals* are self-pollinated. All are *wind-pollinated.* Perennial grass grows either by *rhizomes, runners,* or *suckers,* or by branching at the base form tufts.

GRASSE (43° 39′ N., 6° 54′ E.), town, Alpes Maritimes, France; celebrated for manufacture of essences and perfumes. Pop. 16,000.

GRASSE, FRANÇOIS JOSEPH PAUL, COMTE DE (1722-88), Fr. naval leader; commanded the French fleet which aided Americans in the Revolution; defeated and captured by Rodney, 1782.

GRASSHOPPERS (*Locustidae*) form a family of Orthoptera, differing from true locusts in possessing long, tapering antennæ and four-jointed terminal leg-segments. Many are green in color, and all are herbivorous, and in the main nocturnal, when their chirping music is commonly heard. There are moderately few small species in temperate regions, but in the tropics there is great diversity in size, shape, and color.

GRASS-TREE, popular name for Australian liliaceous plants of genus *Xanthorrhea*; yield resin.

GRATIANUS (375-80), Rom. emperor whose weakness led to revolts; rebellion of Maximus in Britain and Gaul ended in assassination of G.; ardent Christian.

GRATIANUS, FRANCISCUS (XI. cent.), Ital. monk; compiler of the *Decretum Gratiani*, first treatise on canon law (*q.v.*).

GRATIOLA, a genus of scrophulariaceous plants, is world-wide in distribution. The best-known species is *G. officinalis*, the common hedgehyssop, which was formerly used in medicine.

GRATTAN, HENRY (1746-1820), Irish orator and statesman; *b.* Dublin; after studying law in London was called to Irish Bar; entered Irish Parliament, 1775; as leader of national party, advocated removal of authority exercised by Brit. Parliament over Irish Parliament, his attitude leading to enrollment of 80,000 Irish volunteers, ostensibly for defense of Ireland; Britain was compelled to yield to Irish demands, and Ireland obtained Home Rule. In 1800 he opposed bill for Union of Great Britain and Ireland, to which parliamentary corruption and Irish rebellion of 1798 had led; but he afterwards sat in the United Parliament, and until his death worked incessantly for Catholic emancipation.

GRATTIUS, FALISCUS, Rom. poet; author of *Cynegetica*, verse treatise on hunting, etc.

GRAUDENZ (53° 29′ N., 18° 43′ E.), fortified town, on Vistula, W. Prussia, Germany; has iron foundries and breweries; successfully defended against Fr. in 1807. Pop. 40,000.

GRAVEL, fragments of rock, worn round by the action of water. Shore g. is composed of small stones washed up by waves; river gravel, stones washed down by rivers to 'pockets'; includes stones varying in size from that of a pea to a hen's egg. Anything smaller than former is called 'sand'; larger, 'shingle.'

GRAVELINES (51° N., 2° 6′ E.), fortified seaport, Nord, France, on Aa; fisheries; scene of victory of Spaniards over Fr., 1558. Pop. 6,000.

GRAVELOTTE (49° 6′ N., 6° E.), village, Alsace-Lorraine, Germany; scene of Ger. victory over Fr., 1870.

GRAVES, ANSON ROGERS (1842), graduated from Hobart College in 1866, and from the General Theological Seminary in 1870. Ordained in 1871. Held various charges in Nebraska, Minnesota, New Hampshire and Vermont. Consecrated bishop of the Platte in 1890, resigned in 1910. Author, *The Farmer Boy who Became a Bishop* (autobiography); *Sermons for Lay Readers.* Also many tracts for various religious occasions.

GRAVES, FREDERICK ROGERS (1858), American bishop. Educated at Hobart College and General Theological School from which he graduated in 1881. Ordained priest in Protestant Episcopal Church in 1882. Missionary in China until 1883. Professor of Theology, Theological School Shanghai until 1893. Consecrated bishop in 1893. Has written many works on theological subjects in Chinese.

GRAVES, HENRY SOLON (1871), educated at Yale and took special studies in forestry at Harvard; M.A. Harvard, 1911. Became professor of forestry and director, Forest School, Yale University, 1900-10. Chief of U.S. Forestry Service, 1910-20. Author, *Forest Mensuration*, 1906; *Principles of Handling Woodlands*, 1911. Also many bulletins issued by Department of Agriculture. Lieutenant Colonel Corps of Engineers, U.S. Army in France, 1917.

GRAVES, JOHN TEMPLE (1856), American journalist. Educated at University of Georgia. Became editor of Daily Florida Union, Jacksonville, Fla., in 1881, and thereafter edited various papers in Atlanta and Rome, Ga. Editor-in-chief, New York American, 1907-15. Editorial writer on Hearst newspapers since 1915. Orator on many notable occasions. Author, *History of Florida of To-day*; *History of Colleton, S.C.*; *Speeches and Selections for Schools.* Has contributed to various leading magazines as advocate for universal peace by arbitration and on national preparedness. President of U.S. Press Club in 1913.

GRAVESEND (51° 27′ N., 22° E.), market town and river port, Kent, England, on Thames; chief pilot station for river; favorite resort of Londoners; boatbuilding yards; iron foundries; extensive market gardens in vicinity. Pop. 1921, 31,137.

GRAVINA (40° 49′ N., 16° 24′ E.),

town, on Gravina, Italy; bp.'s see; cathedral. Pop. 18,500.

GRAVITATION is the attraction which bodies have for one another due to their *mass*. Newton formulated the *Law of G.* thus: 'the force of the attraction which bodies have for one another is directly proportionate to their masses, and inversely proportionate to the square of their distances apart.' This is the most general property of matter, and no exceptions to Newton's Law are known. If a body is thrown up into the air, it falls to the earth after a longer or shorter period of time, depending upon the greatness of the force opposed to that of gravity. Such a body has a certain attraction for the earth, but since the mass of the earth must necessarily be larger than that of any body on it, the force with which the body attracts the earth must be negligible compared to that with which the earth attracts the body. When the force impelling the body to move upwards is expended, the pull of the earth on the body becomes evident. The value of gravity is 32·2 ft. per sec., and it is unaffected by the nature of the matter. The value of gravity is less at the equator than at the poles, but this does not affect ordinary calculations. By very exact experiment the force of attraction which a body exerts on the earth can be determined. Through the force of g. the sun and various other planets affect the earth, while the earth affects the moon, acting through a distance of 240,000 miles.

The mutual attraction between a body and the earth is represented by its *weight*. The presence of large masses, such as mountains, does not alter the weight of any substance for practical purposes. Weight always acts downwards through the *center of gravity*, (*i.e.*) the point through which the *resultant* of all the forces due to gravity must pass. When a body is lifted a certain resistance is felt. This resistance is the force with which the body is attracted to the earth. Water flowing from a horizontal hose gradually curves towards the earth as the force by which it is expelled horizontally becomes exhausted, and gravity becomes noticeable. A drop of water as it falls towards the ground soon loses its spherical shape and becomes pointed, due to the attraction of the earth on the surface nearest it. See RELATIVITY, THEORY OF.

GRAY, ASA (1810-88), botanist; *b.* Paris, N.Y. He studied medicine and became assistant professor of botany at the College of Physicians and Surgeons New York City, afterwards occupying the chair of natural history and botany at Harvard, 1842-73. He made an exhaustive study of North American flora and acquired note as an authority on taxonomy and morphology. His writings embraced popular textbooks for the young, especially on the growth of plants, and philosophical expositions on the theory of natural selection.

GRAY, DAVID (1838-61), Scot. poet; author of *The Luggie* and some sonnets.

GRAY, DAVID (1870), American author. Graduated from Harvard in 1892; Columbia, Ph.D. in 1904. Instructor in English, University of Texas, 1902-5. Instructor, associate professor and professor since 1905, Leland Stanford University, California. Has written, *Emerson*, 1917; *The Original Version of Love Labor Lost with a Conjecture of Love Labor Won*, 1918. Also the following plays: *Hannibal*, 1893; *A Superficial Girl*, 1899; *The Call of Bohemia*, 1909. Has contributed to philosophical and other periodicals largely on Shakespearian criticism.

GRAY, ELISHA (1835-1901), inventor; *b.* Barnesville, O.; *d.* Newtonville, Mass. He was a competitor of Alexander Graham Bell in inventing devices for the telephone. While studying at Oberlin College he supported himself by carpentry, and later designed a number of electrical appliances, including the self-adjusting telegraph relay, the telegraphic switch and annunciator for hotels, the telegraph repeater, the private telegraph line printer, and the telautograph, by which written messages could be sent over the telephone or telegraph. He challenged the claim of Bell as the inventor of the telephone, claiming priority on the specifications for a speaking telephone filed by him in 1876, but the Supreme Court awarded the patent to Bell. He manufactured electrical apparatus at Chicago and Cleveland and founded the Gray Electric Company at Highland Park,

GRAY, GEORGE (1840), American jurist. Graduated from Princeton in 1879 and from Harvard Law School. Practiced law in New Castle and Wilmington, Del. Attorney-General of Delaware, 1879 to 1885. Appointed United States Circuit judge in 1899 serving until 1914. Member of Peace Commission after Spanish-American War in 1898. Member of International Permanent Court of Arbitration at the Hague. Member of American-Mexican Commission in 1916. Trustee of Carnegie Endowment for International Peace.

GRAY, HORACE (1828-1902), jurist *b.* Boston, Mass.; *d.* Nahant, Mass. He was admitted to the bar in 1848 after graduating at Harvard and studying law there, and established a practice in Boston. In 1864 he was appointed a judge of the Massachusetts Supreme Court, becoming its chief justice nine years later. President Arthur in 1881 made him an associate justice of the U.S. Supreme Court, of which he remained a member till his death.

GRAY, THOMAS (1716-71), Eng. poet; *b.* London; ed. Eton and Peter house, Cambridge; spent two years abroad, in company with Horace Walpole; and afterwards returned to Cambridge, where he spent the rest of his life. He declined the laureateship, on the death of Cibber; but in 1768 was app. prof. of Modern History at Cambridge. His poems include *Ode on a Distant Prospect of Eton College*, 1747, which was followed by *Pindaric Odes*, *The Fatal Sisters*, *The Descent of Odin*, and in 1750 he completed, and sent to Walpole, the MS. of the *Elegy in a Country Churchyard*. Probably no Eng. poem has found wider acceptance than the *Elegy*, or has provided more quotable passages.

GRAYLING, general name for various trout-like Salmonidæ fish; genus *Thymallus*.

GRAYSON, CARY TRAVERS (1878), rear admiral and navy surgeon; *b.* Culpeper County, Va. He was educated at William and Mary College and the University of the South. He received the degree of M.D. in 1902 and two years later graduated from the U.S. Naval Medical School while acting assistant surgeon in the Navy. He passed from that rank through the regular grades of promotion, becoming medical director and rear-admiral in 1916. He cruised round the world in 1905-6 and was naval surgeon of the President's yacht during the Roosevelt and Taft administrations. He became physician to the President in 1912 and served in that capacity during Woodrow Wilson's occupancy of the White House. In 1921 he was made chief of the Naval Dispensary, Washington, D.C.

GRAZ, GRATZ (47° 4′ N., 15° 26′ E.), cap. Styria, Austria, on Mur; has interesting XV.-cent. cathedral; seat of univ. founded 1586; other features of interest are the Landhaus, Stradt-Park ancient fortress of Schlossberg (destroyed by the Fr. in 1809), the Joanneum Museum, and the picture-gallery; bishop's see; active industrial center; manufactures machinery, iron-ware, leather-ware, wine. Pop. 1920, 157,644.

GREAT AMERICAN DESERT, term applied to a large arid area in the western part of the United States and the northern part of Mexico. Much of the territory formerly included in that designation has, however, since been reclaimed by irrigation and is now suitable for grazing and agriculture. Its boundaries are roughly the Rocky Mountains and their continuing ranges in New Mexico and Texas on the east, and the Cascade ranges and the Sierra Nevadas on the west. The region is about 700 miles across in its greatest width, and extends from the Canadian border to Mexico and a considerable distance into that country. The really arid wastes comprise perhaps 550,000 square miles in the United States and somewhat less than that in Mexico. The highest desert stretches are in central Nevada at an altitude of from 5,000 to 6,000 feet; the lowest are in Death Valley, Cal., 427 feet below sea level, and Salton Desert in that State, which is also below sea level. There are few permanent streams, though torrents sometimes descend from the mountain to be quickly swallowed up by the thirsty sands. Sometimes no rain falls for a year, and the average annual precipitation ranges from 5 to 10 inches. Cactus, sagebrush and rough grasses are almost the only plant growths. The temperature for days at a time exceeds 100 degrees and often reaches 130 degrees.

GREAT AWAKENING, religious revival which began in New England in 1740 under leadership of George Whitefield and subsequently spread over America.

GREAT BARRIER REEF, coral reefs off E. coast Queensland, Australia; length, 1300 miles; distance from coast, 15 to 155 miles; supposed form of old Australian coast-line; area, about 100,000 sq. miles; broken by several natural navigation channels.

GREAT BARRINGTON, a town in Massachusetts, in Berkshire co. It is on the New York, New Haven and Hartford railroad, and on the Housatonic river. Within its limits are included the villages of Housatonic and Van Deusen. The town is in the Berkshires and is noted for its picturesque scenery. It is a popular summer resort and residence place for people of wealth. There is a public library and several private schools. The industries include the manufacture of cotton, electrical apparatus and paper. Pop. 1920, 6,315.

GREAT BASIN (*c.* 32° to 45° N., 112° to 122° W.), area in W. Cordilleran

region of U.S.; *c.* 200,000 sq. miles in extent; surface is varied, and includes mountain chain known as Basin Range, which has smooth valleys with shallow salt lakes; the largest is Great Salt Lake.

GREAT BEAR LAKE (66° N., 120° W.), lake, N.W. Canada; discharges through Great Bear River into the Mackenzie River.

GREAT BRITAIN (49° 57′-58° 40′ N., 1° 46′ E.-6° 13′ W.), large islands off W. coast of Europe, consisting of England, Scotland, and Wales. The island has an extreme length of *c.* 605 m.; breadth, *c.* 320 m.; total area, *c.* 88,500 sq. m. The most northerly point is Dunnet Head, in Caithness; most easterly, Lowestoft Ness, Suffolk; most southerly, Lizard Point, Cornwall; most westerly, Ardnamurchan Point, Argyll. Total pop. *c.* 40,900,000. See also BRITISH EMPIRE.

GREAT CIRCLE, any circle of longitude, or the meridian circle at the equator.

GREAT EASTERN, a British merchant vessel of 18,915 tons, built in 1854-57. She became of note as the largest craft in the world up to that period. She was constructed of iron and had paddle and screw means of propulsion. Her length extended 680 feet, and her breadth 82½ feet, or with her paddle boxes, 118 feet. She had six masts, five of which were of iron, and 7,000 yards of sail. Eight engines worked her screws and paddles, capable of 11,000 horse power. She was costly, unprofitable and unfortunate from the start. After a number of runs to New York, she became a troop ship, then a cable-laying ship, and finally declined to a sight-seeing object. In 1888 she was broken up.

GREAT FALLS, a city of Montana, in Cascade co., of which it is the county seat. It is on the Chicago, Milwaukee and St. Paul, and the Great Northern railroads, and on the Missouri river. The city is the center of an important mining region and has large smelting works for the reduction of copper, gold and silver ores. There are mines of lead, iron, zinc and coal also in the neighborhood. Its industries include the manufacture of flour, mining machinery, etc. The surrounding country is an extensive sheep-raising region and is the center of an important trade in wool. The Missouri river is here spanned by two bridges, each over 1000 feet long. The notable buildings include a public library, a city hall and a hotel. Within the city are several parks. The neighboring country is of great scenic beauty. Water power is furnished from the Rainbow and Great Falls, which together produce more than 200,000 horse power. Pop. 1920, 24,121.

GREAT HARWOOD (53° 46′ N., 2° 24′ W.), town, Lancashire, England; collieries; cotton mills. Pop. 13,500.

GREAT LAKES OF NORTH AMERICA, the collective name for six fresh-water lakes—Superior, Michigan, Huron, St. Clair, Erie, and Ontario—situated between Canada on N. and U.S. on S. (41°-49° N., 76°-92° W.), and forming upper waters of St. Lawrence R. Superior, largest lake, is connected with Huron by St. Mary R.; Michigan (lying wholly in U.S.) joins Huron at Straits of Mackinac: Huron empties itself into Erie by St. Clair R., and lake, and Detroit R.; between Erie and Ontario are Niagara R. and Falls. Lakes opened up to navigation, and differences of levels overcome by system of canals with numerous locks. The lakes are frozen for four or five months in winter. Some of the largest and most important towns in N. America situated on shores of lakes. Chicago, on Michigan, and Buffalo, on Erie, share greater part of lake traffic. Around lakes are extensive coal-fields, iron mines, fruit and grain-growing regions. Area exceeds 90,000 sq. m.

GREAT REBELLION, wars in Great Britain, 1642-52, between Royalists and Parliament. See ENGLAND.

GREAT SALT LAKE, a great sheet of water lying in Northwest Utah along the western base of the Wahsatch Mountains, 4,200 feet above sea level. It has a length of about 80 miles and is from 20 to 32 miles wide, but has no great depth, being generally quite shallow. The lake is the chief drainage center of the Great Basin and has a number of inlets, or tributaries, one of which, the Jordan, brings the fresh waters of Lake Utah. It contains several islands, the largest of which, Antelope, is about 18 miles long. It has no fish, but several species of insects people its waters, and its shores are frequented by numerous water fowl. The area is variable, due to the lake's lack of outlet except evaporation. Its clear water consequently holds much saline matter always in solution. Sometimes the water flowing in exceeds the evaporation, resulting in an increase of the lake's area, which has varied between 1,700, 2,280, and 2,360 sq. miles. For the past fifty years the lake has been receding, due to irrigation and a reduced flow from the inlets.

GREAT SLAVE LAKE (62° N., 115° W.), lake, N.W. Canada discharges

by Mackenzie River into Arctic Ocean; *c.* 300 miles long; average breadth, 50 miles.

GREAT SLAVE RIVER, a river in Canada which flows from the Province of Alberta to the Northwestern Territories, into Great Slave Lake. Its total length is about 300 miles and it is navigable for practically its entire length during the open season. The valley through which it passes is of great fertility but is largely unsettled.

GREAT SOUTHERN OCEAN, narrow expanse of water encircling the globe almost completely, between parallels of 40° and 66½°.

GREATER PUNXSUTAWNEY, a borough in Pennsylvania, in Jefferson co., 45 miles N.W. of Altoona. It is in the midst of an extensive coal and iron region and its chief industry is connected with coal mining. Pop. 1920, 10,311.

GREBES (*Podicipedidae*), a cosmopolitan family of swimming birds, with short, close plumage, brown on upper and white and very glossy on under surface.

GRECO, EL, DOMINICO THEOTOCOPULI (*d.* 1614), Cretan artist; pupil of Titian; spent many years in Spain, under the patronage of Philip II.; was an artist of striking and original genius.

GRECO-TURKISH WAR, 1897, see GREECE: *History.*

GREECE, kingdom, S.E.Europe (35°-42° N., 19° 30′ E.), consisting of southern part of Balkan Peninsula and numerous islands—Eubœa, N. Sporades, Cyclades, etc., on E., Crete, Cerigo, etc., on S., Ionian Islands on W.; bounded by Albania, Jugo-Slavia, and Bulgaria on N., Black Sea, Sea of Marmora, Dardanelles, and Ægean Sea on E., Mediterranean Sea on S., Ionian Sea on W.; mainland is almost bisected by Gulfs of Patras, Corinth, and Ægina, and severance is completed by canal across narrow isthmus of Corinth (3½ m.), which leads to southern Morea or Peloponnesus. The coasts are high, rocky and indented. Cape Matapan is most southerly point on mainland of Europe. The northern part consisted, until 1923, of Macedonia and Thrace, secured by the Balkan and World Wars. Farther S. is Thessaly, ceded by Turkey, 1881. The country is traversed on the W. by the limestone Dinaric Alpine fold, Mt. Taygetos, (7,890 ft.), part of which forms the Pindus Mts.; between the roughly parallel ridges are deep valleys (Arachthus, Achelous) and mountain basins (Arta, Agrinion); the Ionian Islands are a partially submerged ridge. Along the E. coast a ridge runs through Olympus, 9,750 ft., Pelion, Eubœa, to island of Mykonos, enclosing lacustrine plains (Thessaly) and landlocked gulfs (Volo). Earthquakes are frequent, especially in S.W. The lower courses of the Maritza, Struma, and Vardar in the N. are in Gr. territory; entirely Greek are the Vistritza, Salamvria, Hellada on E., Arta, Aspro, and Ruphia on W. Climate is Mediterranean; snow lies above 4,000 ft.; rainfall heaviest on W.; deforestation has reduced rainfall and reserves of soil; marshlands are malarial. Below 1,500 ft. the cypress, myrtle, olive, and other evergreens prevail; vine, fig, orange, tobacco, and (locally) cotton and date flourish; above 1,500 ft., where moisture is sufficient, are oak and chestnut forests; from 3,500 to 5,500 ft. beech and pine thrive; higher still flora is Alpine. Fauna is Mediterranean, including wolves, jackals, deer, bears, lynx, badgers, vultures, and snakes (two varieties poisonous). Agriculture, which is backward, is predominant occupation. Chief products are grapes for currants (mostly from Ionian Islands and S. side of Gulf of Corinth and Patras); olives, tobacco, figs; cereals are wheat, barley, rye, and corn. Principal minerals are silver, lead, zinc, emery, copper, magnesium, sulphur, salt, and marble. Chief manufactures are smelting, textiles, and some shipbuilding. Exports include currants, figs, olive oil, wines, tobacco, hides, ores, marble, and sponges; imports, manufactured goods, corn, timber, cattle, sugar, salt fish, coal. Railway mileage, 1919, 1,400; the ship canal across Isthmus of Corinth is rarely used by foreign vessels; the mercantile marine has a tonnage of *c.* 1,000,000. Athens is cap.; chief ports, Piræus, Syra, Patras, Salonica, Volo, Corfu, Kalamata, Laurium, Canea (Crete); Dede-Agach, with free access, secured by Treaty of Peace, for Bulgars.

Area and Population.—The increase of terr. and pop. as a result of the World War gives Greece in Europe an area of *c.* 52,000 sq. m. with *c.* 6,000,000 inhabitants. In 1920 the pop. was estimated at 2,646,913, on an area of *c.* 42,000 sq. m. Pop. includes three main stocks; (1) aboriginal Mediterranean brunettes, purest in Crete; (2) dark, sallow, brachycephalic alpine highlanders, typically represented in Albania; (3) scanty remains of tall, fair, or ruddy northerners whose successive invasions (Thraco-Phrygian, *c.* 1,500 B.C.; Dorian, 1000 B.C.; Galatian, 275 B.C., etc.) mark the main turning-points of Ægean history. It is Albanian blood which mainly differentiates modern from anc. Greeks. Most of the inhabi-

tants belong to the Gr. Orthodox Church; but complete toleration exists. Elementary education is free and nominally compulsory between ages of five and twelve. In Athens are a univ., a polytechnic, an industrial academy, and two schools of agriculture.

Administration.—Greece is a constitutional monarchy. The present king is George, son of Constantine, who was forced to abdicate in 1917. The government is carried on by a ministry and a single chamber of paid deputies, elected by manhood suffrage. The army is conscript, between ages of 21 and 57. The effective strength, 1915, was 3,970 officers and 55,800 non-commissioned officers and men. About 150,000 men fought in the Allied armies. The navy, partly conscript, has been reorganized by British officers. It consisted 1919, of 6 ironclads, 1 cruiser, 20 destroyers and torpedo boats, and 2 submarines.

History. Prehistoric Times.—The term *Aegean Civilization* is used to denote the culture of Greece and the Ægean islands, with outposts both E. and W., before the coming of the historic Greeks. It is a civilization whose discovery has only been made within the last generation by the unearthing of various archæological remains. It has no literary records except inscriptions, which are still undeciphered. It seems certain now that in primitive times these lands were inhabited by a long-skulled, dark-skinned people to which the name of Mediterranean race has been given. The Stone Age came to an end about 3000 B.C., and from that time civilization greatly improved and a state of culture was reached unsurpassed till classical times. The center of this was Crete, especially the cap., Cnossus; recent excavations show the various stages of culture, sometimes called Minoan (from King Minos); and Dr. A. J. Evans divides it into Minoan I., II., and III., each in three subdivisions, coming to an end about 1000 B.C. The art is quite distinct from that of neighboring races, though it shows affinities with Egypt and Phœnicia. The occurrence of Ægean objects in the tombs of Egyptian kings has enabled us approximately to date the civilization to which they belong. Minoan civilization reached a high pitch about 2000 B.C., then after a temporary decline its highest point about 1600, when the city was burnt. It revived somewhat, but was finally destroyed about 1000, when this civilization in Crete came to an end, though it may have lingered a little in Cyprus and elsewhere. The destroyers were probably still uncivilized Greeks from the north. On the mainland the chief centers were Mycenæ (where it is sometimes called *Mycenoean*) and Tiryns. Anc. Ægean costume, curiously, resembled modern dress more than classical. Its religion was a form of nature worship. A goddess, who appears possibly in the Gr. Artemis and Aphrodite, and her divine son and partner were the chief deities. Whether an Indo-European tongue was spoken or not is uncertain.

Ancient History.—The Greek people are a branch of the great Aryan or Indo-European family. They came down from the mountain district that stretches from the Alps to the Himalayas, and dispossessed a people of advanced civilization that held the lands round the Ægean Sea.

The Greeks were divided into three great families—Ionians, Æolians, and Dorians; the Dorians came last and established themselves in the south. Argo, Sparta, Corinth, Messenia, and Ægina formed their chief settlements. Their invasion drove many Ionians and Æolians to Asia Minor, where some of their kinsmen must already have been settled. Athens and Eubœa were chief Ionian districts in Greece proper, Bœotia chief Æolian.

The Ionians of Asia Minor, no doubt inspired by contact with the more civilized East, first developed Gr. science, literature, and art: Miletus, Smyrna, Chios, Samos, and later Ephesus, are their chief settlements; Lesbos was the chief Æolian. In the S., Dorians spread across the Ægean, to Crete, Rhodes, and Cnidus.

By 700 B.C. Gr. trade was flourishing, and many colonies were founded along the coasts of the Black Sea, Thrace, S. Italy, Sicily, and other lands. Miletus, Megara, and Chalcis in Eubœa, were the chief colonizing cities, and trade ranged from the Caucasus and Egypt in the E. to S. Gaul and Spain in the W. The Phœnicians were their principal rivals, and Carthage, with Etruria, always opposed them.

In Greece proper, Argos established her position as head of the Peloponnese, but Sparta soon challenged her. Finding a need for expansion, the Spartans, organized as a race of warriors under the constitution of Lycurgus, conquered all Laconia and Messenia, and by 500 B.C. had established themselves at the head of a league which embraced nearly all the Peloponnese: a great victory over Argos, 495, left Sparta undisputed head of Greece at time of Pers. wars.

Tyrants (unconstitutional monarchs) established themselves in some cities at various times between 700 and 500 B.C. Periander of Corinth, Cleisthenes of Sicyon, Thrasybulus of Miletus are the chief; their influence was largely for good, but no tyranny could long stifle Gr. love of freedom.

Athens comes into prominence in the 6th cent.; her great lawgiver, Solon, set a high ideal, which the tyranny of Pisistratus did little to destroy. After the expulsion of the tyrants, 510, the constitution was organized by Cleisthenes on a more democratic basis.

Persian Wars.—The Gr. cities of Asia Minor had first been attacked by Lydia, and all subdued except Miletus; in 546 Cyrus of Persia overthrew Crœsus of Lydia; all Ionia was reduced thereafter, except Miletus, which made a separate treaty. Darius, 521-485, determined to extend his empire into Europe, but first had to deal with the Ionic revolt, led by Miletus and Chios. The Athenians helped to burn Sardis, but the revolt failed for lack of unity, and their defeat at Lade, 494, destroyed the Ionians.

Thereafter Darius' general, Mardonius, secured Thrace and Macedonia, 493, but failed to reach Greece. A second expedition, under Datis and Artaphernes, sailed across the Ægean, took Eretria, and landed at Marathon, 490, but was defeated by the Athenians under Miltiades. The third expedition, 480, was led by Darius' successor, Xerxes. Themistocles had organized the Athenian fleet in the interval, and Athens, Corinth, and Ægina were the protagonists in the decisive victory of Salamis, after Leonidas and the 300 Spartans had nobly died in defense of Thermopylæ. Xerxes fled, leaving Mardonius in Bœotia. A simultaneous attack on Sicily by Carthage was defeated by Gelo, tyrant of Syracuse. Next year the Greeks under the Spartan Pausanias defeated Mardonius at Platæa; a victory by sea and land at Mycale finished the war, which determined the fate of Europe. The subject cities were gradually freed by the Confederacy of Delos, a mar. league led by Athens.

This confederacy developed into an Athenian empire, and its members gradually became subjects. Cimon and Pericles successively developed Athenian strength—the former winning great victories at the Eurymedon, 467, and in Cyprus (against Persia) in the E.; while Pericles, the organizer of Athenian democracy, aimed at land empire. Athens crushed Ægina, defeated Corinth, and established a short-lived supremacy in central Greece, ended by a defeat at Coronea, 447, by Thebes.

Sparta had had trouble in the Peloponnese after the Pers. wars, but had recovered, and crushed a rising of the Helots (serfs); gradually the antipathy between the Empire and the League rose, fostered by Corinth, Athens' great trade rival, until it culminated in the Peloponnesian War, 431,404: Athenian *v.* Spartan, Ionian *v.* Dorian, democracy *v.* oligarchy. Athens met with success at Sphacteria, 425, but was defeated by Thebes at Delium, 424, and Brasidas the Spartan made havoc of their Thracian possessions. From 421 to 413 the Peace of Nicias closed open hostilities. Sparta defeated her old rival Argos at Mantinea, 418, while Athens ambitiously tried to gain Sicily and attacked Syracuse, 415; but the great Sicilian expedition met with a memorable disaster. This led Sparta to renew the war; her capable admiral, Lysander, aided by Pers. money, eventually defeated Athens at Ægospotami, 405, and starved the city into surrender. During this time Athens' one capable man, Alcibiades, proved untrustworthy, and internal dissensions aided her fall; the conquerors granted easy terms.

Sparta now took over the Athenian Empire, but mismanaged it; her allies turned against her, and she began to fail, partly for lack of men, as shown by an attempt by Agesilaus to attack Persia. Athens revived somewhat; Thebes developed strength under Epaminondas, who defeated the Spartans at Leuctra, 371, and organized Arcadia and Messenia against them; a further victory at Mantinea, 362, ended Spartan power, but Epaminondas was killed—his work had been entirely destructive.

Macedonian Empire.—Worn out by struggles, the Greeks of central and southern Greece fell a prey to the semi-alien power of Macedon under Philip; the resistance of Thebes and Athens, led by the orator Demosthenes, ended at the battle of Chæronea, 338. His son Alexander had larger schemes: in the name of Greece he attacked Persia; in the three great battles of the Granicus, 334, Issus, 333, and Arbela, 331, he defeated the Persians by the famous Macedonian phalanx, and extended his sway to the Hindu-Kush and the Indus. He tried to hellenize the East, but his premature death, 323, left his work half done. His generals divided his empire: the western part of Asia Minor remained Gr. for centuries, but beyond the Euphrates the Oriental element eventually triumphed.

In Greece-proper Macedon resumed the position of a semi-alien but dominant state, and the chief feature is the rise of federations, of which the chief were the Ætolian and Achæan leagues. [In 198 Rome began to look eastwards, first to protect the Greeks from Macedon, then, in their own interests, to govern them; eventually it became necessary to subdue them, and the destruction of Corinth, 146, marked the end of Gr. independence.

The Greeks in Sicily, after the Athenian expedition, found a strong enemy in Carthage, who took in succession Himera, Selinus, and Acragas, and threatened Syracuse, which was saved by the tyrant Dionysius. The struggle continued intermittently with varying fortunes till Rome intervened to help the Greeks, and the first Punic War, 264-241 gave Sicily to Rome.

Greece came under Roman control in 146 B.C., when Mummius, the Roman general sent to support Sparta, captured and ruined Corinth and defeated the Achæan League. Macedonia then became a province of Rome, and with Achæa was governed by a prætor. Many Gr. institutions were left unaltered, but the cities were deprived of all political importance. The country enjoyed considerable prosperity, which was interrupted by national rising led by Mithridates in 1st cent. B.C.; this was suppressed by Rome with great severity by 84 B.C., after which the country was in evil case for some time. It revived under the empire, and was recognized as supreme in the field of culture. Christianity was introduced in the 3rd cent., and from this time old paganism gradually declined.

Mediaeval and Modern History.—Greece suffered from invasions of Western Goths in 3rd cent., Vandals and Eastern Goths in 5th cent., Slavs from the 6th cent. onwards. After break-up of Roman Empire, Greece formed part of Byzantine dominions till 1204, when it was seized by Latins. During 13th cent. it was sub-divided into fiefs; greater part of country conquered by Turks by 1460; Venetians for some time retained several of the islands, and warred against Turks from time to time, but by 1718, whole country was under domination of Porte. Greeks, who remained in subjection till 1821, were allowed by their Turk. masters to acquire considerable wealth, and the increase of education and culture which followed resulted, early in 19th cent., in a revival of national feeling. In 1821 open rebellion broke out, and the war of Gr. independence began with a rising in Moldavia. The Turks vainly tried to suppress revolt by terrible cruelties and massacres, but within the year they were expelled, Greece regained her freedom, and a national constitution was framed. Turkey, however, obtained reinforcements, under Ibrahim Pasha, from Egypt, and reconquered country in 1825. The Gr. cause was then taken up by Britain, Russia, and France, whose combined forces destroyed the Turk. and Egyptian fleets at Navarino, 1827; further Russian victories on land completed Turk. discomfiture, and in 1830 the independence of Greece was declared by the London protocol. In 1832 a monarchy under Otho of Bavaria was established; but his despotic rule proved so unpopular that a revolution occurred, and he had to leave the country in 1862. Prince George of Denmark became king in 1863, with consent of Britain, France, and Russia. Under him the country enjoyed a fair degree of prosperity until the outbreak of war with Turkey, the king's unwillingness to engage in which made him somewhat unpopular. Dissatisfaction in Greece concerning the Greco-Turk. boundary and possession of Crete resulted in Greco-Turkish War in spring, 1897. In Thessaly Greeks suffered series of defeats—Larissa, Pharsala, and Velestino being taken by Turks, who were also victorious in Epirus at Homopulos and at mouth of river Luro. Tsar intervened; armistice arranged which resulted in agreement whereby Greece paid an indemnity of $18,000,000, but lost little territory. Outbreak of a military revolutionary movement in 1909-10; rivalry with Rumania on the Macedonian question, which in 1905, 1906, and 1910 resulted in the breaking off of diplomatic relations between the countries; constant difficulties with European Powers on account of Crete; declaration of war against Turkey by Greece, Oct. 18, 1912 (see BALKAN WARS); assassination of king March 18, 1913; succeeded by his son Constantine, who renewed war with Bulgaria, June-Aug. 1913, and as result enlarged boundaries of the kingdom along N. Ægean coast.

Greece and the World War.—At the outbreak of the World War the Gr. premier was Eleutherios Venizelos, who five years previously, by his solution of the Cretan difficulty, had saved both Greece and the dynasty. It was he who had formed the Balkan League, and naturally he was eager to fulfil the treaty obligations of 1913 should Serbia be attacked by Bulgaria. From the first he believed that the future of Greece was bound up with the victory of the Allies, and he was strongly in favor of armed intervention on their behalf. Constantine, the king, was a pro-German, brother-in-law and warm admirer of the Kaiser. He was only prevented from openly siding with the Central Powers because of the vulnerability of his country to naval attack. Consequently, his best service to his friends was to maintain a neutral attitude. About May 1915 Baron Schenck appeared in Greece, and at once began a pro-German propaganda, which had considerable success. The Russians were then retreating; the British were making no headway in Gallipoli, and many

Greeks had lost faith in the Allies. Thwarted by the king, Venizelos resigned, and was succeeded by Gounaris, but at the general election in June he won a sweeping victory. The king's illness was made the excuse for delaying the meeting of Parliament. On Aug. 21, Venizelos again assumed the reins of power as prime minister.

Between the election and his return to power the Allies proposed that Greece should give up Eastern Macedonia to Bulgaria in order to keep her out of the war, and to this Venizelos agreed. At once the royalists denounced him as a traitor, and there were many defections from his side. Early in September, with the quasi-concurrence of the government, Venizelos invited the Allies to send 150,000 troops to Salonica, promising that Greece would mobilize. The king signed the mobilization order, but when on Oct. 6, while the Allied troops were arriving, he repudiated the declaration of Venizelos that no resistance would be offered to their passage, that statesman had no option but to resign. A stop-gap government was installed. On Oct. 14, 1915, Bulgaria declared war on Serbia, and shortly afterwards the Allies offered Cyprus to Greece if she would actively intervene on their behalf. The offer was refused. Later on in the month Venizelos and his friends carried a vote of want of confidence in the government, which resigned. Another premier was set up; but as he was at the mercy of the Venizelists, Parliament was dissolved and a general election was announced for the following December. The election was a perfect farce: the crown used every endeavor to prevent its opponents from holding meetings and going to the polls. A royalist Parliament was elected, and Constantine again made professions of strict neutrality.

In Aug. 1916 the Bulgars invaded Gr. territory. The Gr. frontier fortress of Rupel, in the valley of the Struma, had already been surrendered to them on May 26, and the Gr. port of Kavala was yielded to them on Sept. 12. These ignominious surrenders alienated many Greeks who had formerly supported Constantine. Venizelos held mass meetings, and begged the king to place himself at the head of the nation and defend its honor. Meanwhile the first step in active revolution had been taken. An officer of Cretan gendarmerie had induced three regiments of the 11th Division to join a movement for defending Gr. soil from Bulgarian aggression. The Allies also protested, and in a note denounced the December elections as illegal, and demanded an honest election. A few days later they applied pressure by refusing to allow Gr. ships to enter or leave harbor. The king replied by stirring up the army reservists against the Allies, who responded by demanding the disbandment of the army, the holding of fresh elections, and the dismissal of pro-German officials. The presence of Brit. warships forced Constantine to agree to these demands. The government resigned, and another premier was appointed.

Rumania had declared war on behalf of the Allies on Aug. 27, and again the question of treaty obligations arose. Venizelos now announced that if Greece did not join the Allies it would be his duty to head a revolution. For a moment Constantine was alarmed, but fortified by reassurances from the Kaiser held out against Venizelos, who now began to take action. On Sept. 24 Crete disowned the Athens government, and joined the national movement under her old prime minister. With headquarters at Salonica, he set up a government of national defense, his leading coadjutors being Admiral Condouriotis and General Danglis. Men flocked to his banner, and were armed and munitioned by the Allies. Constantine now perpetrated another piece of treachery by ordering the 4th Army Corps at Kavala to surrender. The troops were disarmed and sent to Germany to prevent the possibility of their being utilized by the Allies. In the meantime a succession of notes had been passing between the Athens government and the Allies, and further acts of naval pressure had forced Constantine to deport Schenck and his fellows. Nevertheless, he was still engaged in trying to thwart and trick the Allies.

Early in October Admiral Dartige du Fournet demanded and received the surrender of the Gr. fleet under the threat of blockade. Constantine, who had massed his troops in Thessaly on the flank of the Allies, now made his last effort to join hands with the Bulgars. The situation was extremely dangerous. Allied blue-jackets were landed to occupy certain of the forts round Athens, and thus to control the railways. Rioting took place, and on Nov. 16 the Allies demanded the surrender of the mountain batteries before Dec. 1. This had not been done by the time fixed, and the Allies prepared to land some 2,000 troops. Meanwhile Constantine had posted his men in positions from which they could command the buildings in which the Allied troops were to be housed. Firing began almost immediately the Allied troops landed, and 13 French and British were killed and 25 wounded. In the evening the Allied warships proceeded to bombard the city. Constantine again temporized, and

reign of terror began. Venizelists were imprisoned and murdered, and the Allies proceeded to blockade the coasts. On Dec. 15 the Gr. Government was ordered to stop the movement of all troops and material to the N., and Constantine was forced to yield, and after an ultimatum he also had to agree to apologize for the attack on the Allied troops, and to salute their flags publicly. This was done on Jan. 20, 1917. In May of that year, however, the king was as defiant as ever; bands of his irregulars threatened the Salonica lines of communication; and there were fears that when the crops of Thessaly were reaped they would be handed over to the enemy. The Allies thereupon bought the crops, and landed a Franco-Brit. column to protect the reapers. By this time nine-tenths of the people had joined the national cause. Constantine was still a stumbling-block, and on June 10 his abdication and that of the crown prince were demanded within forty-eight hours. On June 14 he left Greece, and his second son, Alexander, succeeded to the throne. Venizelos formed a new cabinet, and thereafter Gr. troops participated in the Salonica campaign. At the peace settlement Greece received most of the territories of Turkey in Europe, various Ægean islands, Cyprus, and the Smyrna dist. of Asia Minor. In 1919 Alexander morganatically married Mlle. Manos. He died on Oct. 25, 1920, from the bite of a pet monkey. Condourtiotis was appointed regent, and the question of the dynastic succession was referred to the people in the ensuing elections. The elections resulted in a strong expression on the part of the people for the return of Constantine and his establishment as king, and in January 1921, he returned to Greece and was welcomed with acclamation. Under his direction aggressive measures were taken to carry on warfare with Turkey in Asia Minor, and a large army was raised for that purpose. The campaign continued throughout 1921 and the greater part of 1922 without decisive results to either Greece or Turkey. In the autumn of 1922, however, the Turks under Mustapha Kemal, in a series of aggressive attacks, disastrously defeated the Greek army and put an end to the war. Smyrna was taken and burned. The whole area of Asia Minor came into the hands of the Turks. See TURKEY. The Greek cabinet at once resigned and so great was the popular displeasure with the king that Constantine abdicated in favor of his son, George. He retired to the island of Palermo where he died January 11, 1923. The government was now controlled by a revolutionary committee with George as the nominal head. The generals and statesmen who were held responsible for the disasters in Asia Minor were tried for treason and several were executed. Among those tried was Prince Andrew, the king's brother. He was, however, acquitted. As a result of these disasters Greece lost most of the territory acquired through the Treaty of Sévres. The Turkish government, under the direction of Mustapha Kemal demanded return of all territory, including Thrace, and the deportation from that territory of all the Greeks. These demands were practically all granted at the Lausanne conference (*q.v.*) in 1923. See LAUSANNE CONFERENCE OF. There was much suffering among the Greek refugees from Asia Minor and from Thrace. From the latter country the greater part of the population fled. As the result of the murder of Italian officials in Janina, Italy seized Corfu, and compelled the payment of a large indemnity in Sept., 1923.

The *Greek Religion* was an important aspect of Gr. civilization. Recent research into anthropology, comparative religion, and mythology has made it possible to view it in relation to other systems of belief. Though Gr. religion possessed no doctrinal system, there are certain definite characteristics which marked it off from that of neighboring peoples. It has been defined as 'anthropomophic polytheism.' Some elements of it were brought in by the Greeks; others were taken over from the older non-Aryan peoples of the Mediterranean, of whose importance we have only lately come to know. One authority distinguishes two types—the Olympic, the joyous worship of the gods; and the Chthonic, the propitiation of malevolent deities. Certainly the Greeks conceived the gods to be like 'big men' with human passions, while to the Romans they were more shadowy. Greek religion was profoundly influenced by the introduction of the cult of Dionysus, and by Orphism. These superimposed a mystery religion upon older cults. In the cent's immediately preceding the Christian era Greece was more than ever influenced by Oriental worship and modes of thought, and thus prepared the way for Christianity. See GREEK CHURCH.

Language.—The Gr. language belongs to the Indo-European group. Little is known of the pre-Hellenic population of Greece, and surviving elements of the language, chiefly in place-names, show no kinship with the Gr. tongue. But this evidence is not conclusive, and the eventual deciphering of Cretan records may prove an unexpected and uncontestable argument in favor of a close relationship. As it is, Prof. Ridgeway holds that the Achæans adopted

the language of the Pelasgians they conquered.

The physical features of Greece and the adjacent islands fostered a diversity of dialects. The country is broken and irregular, and mountain barriers separate state from state. Gr. dialects are usually classified into Æolic, Doric, Ionic, and Attic. It was not till the unification of Greece under Macedonian rule that the dialects broke down and a common dialect was established (*koine dialektos*). Of this one of the best-known examples is the Greek of the N.T.

The Gr. alphabet differs from the Roman. The language is synthetic and inflectional. In Greek we find reduplication verbs. In nouns only five cases survive out of the original eight—nominative, vocative, accusative, genitive, and dative. Greek, like Sanskrit, has three numbers—singular, dual, and plural. The conjugation of the verb is extraordinarily fine and subtle, and is unparalleled in its power of expressing delicate shades of meaning. A fully conjugated verb has three voices and 507 forms.

The vowel-music of the Gr. language is extremely rich. Especially beautiful are the diphthongs Gr. words terminate either in a vowel or in the consonants *n*, *r*, *s*, and *x* (the preposition *ek* alone excepted). This gives the language great flexibility, beauty, and grace. The vocabulary is very copious, and yet it retained perfect purity.

The Attic dialect, through the supremacy of Athens, became the dialect of refinement and culture, but the others were adopted as literary dialects in various branches of poetic composition.

Literature.—Greek literature falls into six divisions—(1) Early literature, up to *c.* 475 B.C., including epic and lyric (2) Attic, up to *c.* 300 B.C., including the drama and the development of prose; (3) Alexandrian period of the decadence, up to *c.* A.D. 146; (4) the Græco-Roman period. up to *c.* 529; (5) the Byzantine period, up to 1453, the date of the capture of Constantinople by the Turks; (6) Modern Greek, up to the present day.

Ancient.—Gr. literature, as it was a spontaneous growth and uninfluenced by previous and extraneous models, affords a peculiarly instructive study of a natural evolution. The progress of Gr. letters is traced from impersonal epic to personal lyric, and from individualistic lyric to democratic drama. Prose developed later than poetry, and side by side with the drama. Anc. Gr. poetry commences with the *Iliad* and the *Odyssey*—the supposed work of Homer. Sprung as these epics certainly were from a ballad epoch, in the shadowy times of unwritten literature, their co struction is so artistic and their un (despite a few inconsistencies) so co plete that they must have taken th final form from the genius of a gr artist. The groundwork of the poems a body of Achæan ballads transmuted the Æolian bards of Asia Minor a finally shaped by Ionic genius. Th dialect is Ionic, with an admixture Æolic, and the metre is hexamet

The epic tradition was continu by the so-called cyclic poems, whi completed the tale of Troy divine. the 8th cent. B.C. arose the great p Hesiod. The keynote of the Home poems is joyousness unalloyed by ste reflection; the Hesiodic poems are ess tially didactic; the gospel of the *Wo and Days* is a gospel of toil unceasi The didactic tradition was continued the early cosmologists—(*e.g.*), Xenop anes and Parmenides. Attributed Homer is a collection of hymns (t *Homeric Hymns*) addressed to vario deities. These hymns really belong the 6th cent. B.C., when a recitation the poems of Homer was one of t competitions of the Panathenæa. T reciter was called a rhapsodist, and t hymns were the preludes which w sung to the presiding gods.

The epic period was succeeded by t lyric age. Lyric verse, like epic, had origin among the Ionians, and is t outcome of the intellectual awakeni that followed the great migratory ent prise. There are two broad divisio of lyric—elegiac and iambic. Eleg metre consists of the smooth, flowi hexameter, followed by the broken fl of the pentameter, a metre peculia well adapted for meditation and refl tion. Elegiac verse suits manifold su jects: Tyrtæus employed it for mart themes, Mimnermus for erotic, Sol for gnomic, and Simonides for co memorative. Subsequently elegiac a iambic verse lost their instrumen associations, and Gr. melic poetry w confined to the Dorian and Æol species. The Æolian was personal a monodic: the Dorian was civic a choral. Æolian verse had its m glorious representative in Sappho. T fragments of her poetry show de passion and supreme beauty of fo Pindar gave to the Dorian choral ly the breadth of Panhellenic spirit.

Out of the dithyramb (triump song to Dionysus) was developed dra In the history of the early developm of the dithyramb stand Arion a Stesichorus, but the real history of drama commences with Thespis of Ica who introduced one actor, and so m dialogue possible with the leader of chorus. To this stage belonged Ph

nichus, the author of the historical drama, *The Capture of Miletus*. Æschylus introduced the second actor, and reduced the importance of the chorus—an epoch-making advance. Thus dialogue became dominant, and three parts became possible, as an actor could take two roles. Among the dramas of Æschylus that remain is the great trilogy on the house of Agamemnon. The *Agamemnon* tells of the murder of the king by Clytemnestra, the *Choephori* deals with the Nemesis that tracked the avenger Orestes, and the *Eumenides* shows the final reconciliation between the Furies and the avenger. The dramas of Æschylus are essentially idealistic. The laws of heaven fulfil their purpose, and that purpose is good, though attained at the cost of individual sacrifice. This is the dominant thought—the fathers sin, and their sins are visited upon the children unto the third and fourth generations.

Sophocles is less universal in his themes. With him the psychological problem is supreme. Tragedy arises where there are duties in conflict, where the will is other than the deed. Thus Antigone has to choose between duty to the written law, or duty to the greater unwritten law. Œdipus had to front the awful consequences of a rash action.

With Euripides we pass from idealistic to realistic drama. The hero, though he be demigod of story, becomes a man, and the conflict he has to face is some subtle, sophistical problem of contemporary Athenian life. Too frequent use is made of the *Deus ex machina*, and the chorus is made a mere embellishment with no vital connection with the story.

Gr. comedy, like tragedy, had its origin in the cult of Dionysus. It springs from the harvest festivals. Old comedy is represented by Eupolis and Aristophanes, with its fearless ridicule of contemporary events and personalities. The middle comedy criticizes movements and not individuals. The new comedy, represented by Menander, deals with the humorous aspects of domestic life. See also under DRAMA.

The earliest traces of Gr. prose belong to the 6th cent. B.C., and these are mainly genealogies and cosmologies. Herodotus was the father of literary Gr. prose. His sentences follow the 'loose' construction. His history is intended to corroborate his theory of the conflict of the East and West.

Thucydides is a much more critical historian. His sentences are periodic in structure, and his chief virtue is the revelation of character. His style is restrained and sterling. He is the most characteristically Gr. prose writer. The work of Xenophon is less profound in character, less perfect in finish.

Gr. oratory vacillates between the plain and the ornate, the simple and the florid, till it culminates in the perfect balance of style attained by Demosthenes.

The writings of Plato cannot be overlooked. As a stylist he is almost as great as he is as a philosopher.

The poetry of Alexandria was not truly Greek in character. It was artificial and scholarly; its appeal was very limited. Theocritus was the most natural poet of the Alexandrian school. Less spontaneous were Apollonius Rhodius, Bion, and Moschus.

Byzantine literature, though it affords much invaluable information, has no permanent value or purely literary qualities.

Modern Gr. literature has produced nothing that is really great. Some of the ballads, folk-songs, and pastorals are beautiful in sentiment and sweet in expression, but the glory of Gr. literature is of the ancients.

Art.—Gr. art may be conveniently classed under three heads—architecture, sculpture, and painting. From what survives of the architecture and sculpture, one can conjecture with some degree of certainty to what heights of perfection Gr. art developed in these two branches; but the remains of Gr. painting give us no adequate idea of what was the degree of development in that art.

Architecture.—Out of primitive or Mycenæan arch., which showed genius of a bold and virile type, the Doric, Ionic, and Corinthian orders were developed. The column is the distinguishing feature of these three types, as it is perhaps the distinguishing feature of Gr. arch. in general. The column had its origin in the tree trunk used as a prop in primitive dwellings. In Greek the columns were fluted and slightly tapered. The Doric column is simplest and most impressive, being capped by a simple square abacus. Its development culminated in the exquisite proportions of the Parthenon. The distinguishing feature of the Ionic column is the volute and torus. The Corinthian pillar is more ornate, and belongs to a later age in the history of Gr. architecture. Tradition states that its head, with the graceful leaf designs, was suggested to its inventor, Callimachus, by the twining of the leaves of the acanthus plant. The Corinthian pillar was susceptible to embellishment, and with the decay of the pure Gr. genius it degenerated into designs tawdry and trivial.

Gr. arch. at its best is marked by a noble and simple symmetry. That definiteness which is so characteristic

of the Gr. genius is reflected in the exquisite precision of the temples and their chaste beauty. Greece in the structure of her temples was true to her motto, that there ought to be 'Nothing in excess.' See ARCHITECTURE.

Sculpture.—To pass from Gr. arch. to Gr. sculpture is a natural step, because the metopes of the temples were adorned with the finest masterpieces of sculpture, and within the temples stood the statues of the gods. Gr. sculpture, like the other Gr. arts, is in spirit ethical and ideal. It is an exquisite mingling of the human and the divine. Inspiration was sought from the gods, on whom the Gr. mind loved to dwell, but the sculptor's material was found in the palæstra. It was the perfection of the human physique, produced by the system of Gr. physical culture, which produced the magnificent statuary which will ever be the glory of Greece and a wonder of the world. The temple statue developed out of the rude image of a deity rough-hewn out of a tree trunk. Up to class. times, such rude images survived in the anc. temples; and the Hermes busts that stood, in the time of the highest civilization of Greece, at the cross-roads mark the transition from tree trunk to marble statue. Moreover, just as the most perfect of Gr. columns, the Doric, was marked by a solemn simplicity of line, so the finest examples of Gr. statuary were marked by a sublime freedom from all traces of sentimentality. The pose, too, of the statue at first showed the obvious influence of the tree-trunk type. The members were arranged in rigid symmetry, the legs and arms being stiff and straight.

At the period of the perfection of Gr. sculpture—the period of Pheidias and his school—the statue had lost its rigidity, but still retained a suggestion of calm and dignified composure. Gr. art was really on the decline when the sculptor sought to portray complex distortions of the frame, though the beauty of such a group as the *Laocoon* of the Rhodian school cannot be denied. Such distortions are conspicuous by their absence in the sculptures of the Parthenon, which, if they are not the actual work of the great Pheidias, belong to his school. The calm dignity of these works has fixed them for all time as the perfect types of classic beauty. Just as in literature the noble grandeur of Æschylus and Sophocles was followed by the more human and sentimental dramas of Euripides, and just as in arch. the solemn severity of the Doric column was superseded by the ornate and more complex designs of the Corinthian order, so the sentimentality of the decline invaded Gr. sculpture. Thus, if Pheidias is the Æschylus of Gr sculpture, Praxiteles is the Euripides As Euripides made his gods human so Praxiteles made his statues human His statue of Venus, colored (as Gr statues usually were), seemed the very incarnation of sensuous beauty; and the exquisite tenderness of the famous statue of Hermes with the infant Dionysus (the best-preserved and most authentic masterpiece of Gr. sculpture is a sign of the decay of the sublime in Gr. art, it is not a sign of the decay of its beauty.

Painting.—As no paintings of the class. age in Greece survive, criticism of this art is reduced to conjecture. One can make deductions from Roman wall paintings excavated at Pompeii. Very probably Gr. painting was weak in regard to perspective. More valuable material is derived from Gr. vase-painting. The specimens which have survived of Mycenæan vase-painting reveal beauty of the bold and virile type, and stand comparison in some respects with the art of the best period. The Dorian conquest as it temporarily threw back the progress of Gr. civilization, seems to have had a similar influence on art. The art of vase-painting evolved from crude geometric designs and rigid figures arranged with labored balance. The potter of the early ages set black figures on a light background. The result always tended to be ludicrous. Later, red figures on a dark background were introduced. Lines of expression and anatomy were applied in black glaze. Normally the vase was black and red. White and brown embellishments belong to a later age. The decline in Gr. vase-painting is traced by the growth of elaborate detail and ornament.

Greek art borrowed from the art of the East, but what it borrowed it made its own, by infusing into it its characteristic spirit of beauty and idealism. While the art of the East distorts the human frame and degenerates into the quaint and grotesque, Gr. art ennobles what is real and rises into beauty and sublimity. Moreover, there is a chastity in Gr. art which is unique in the history of the world. The Gr. artist knew that what is imperfect cannot be made perfect by elaboration and embellishment. The key to Gr. art is found in the method of the sculptor, who studied the perfect human physique of the wrestling-ground, and, working by an inductive method conceived hence his ideal of the divine nature. This conception gave birth to the beauty which is truth, for it was always faithful to what is. Gr. art therefore, idealizes the real rather than realizes the ideal. See MAP, NEAR STATES OF S.E. EUROPE.

GREEK ACADEMY. See ACADEMY

GREEK CHURCH. The correct name is the Holy Oriental Orthodox Catholic Apostolic Church, the term Greek simply indicating its early history. It comprises that group of Christian churches in the East, which, while not owing allegiance to Rome, has preserved an ecclesiastical and sacerdotal system much resembling hers, and has continued with but little change from primitive times. The Gr. Church consists of four ancient patriarchates—Jerusalem, Alexandria, Antioch, and Constantinople, and several national churches in communion with these, but independent in government. Most important of these are the Hellenic Church, the Russian Church, the Orthodox Church of the late Austrian Empire, the National Churches of Serbia, Rumania, Bulgaria, and the Churches of Cyprus and Mount Sinai.

In doctrine, the Eastern Church agrees on the whole with the Roman. The only point on which there is essential difference is the manner of the procession of the Holy Ghost. The Oriental Church maintains that He proceeds from the Father alone, and its dislike to the Latin addition of the phrase *Filioque* to the Nicene Creed has been the chief obstacle to reunion, although the questions of primacy and infallibility of the Pope also present difficulties.

GREEK FIRE, liquid inflammable and explosive mixture, used in mediæval warfare.

GREEK LANGUAGE AND LITERATURE. See GREECE.

GREELEY, a city of Colorado, in Weld co., of which it is the county seat. It is on the Union Pacific, the Denver, Laramie and Northwestern, and the Colorado and Southern railroads, and on the Cache la Poudre river. The city is the center of an important agricultural and cattle-raising region and it has a large trade in potatoes, flour, wheat and other agricultural products. Its industries include lumber yards, flour mills, a beet-sugar factory. Here is the State Teachers' College, and there is also a public library and two parks. The city was the site of the so-called 'Greeley Colony' named after Horace Greeley, which was the first agricultural community in the State. Pop. 1920, 10,883.

GREELEY, HORACE (1811-72), journalist; *b.* Amherst, N.H.; *d.* Pleasantville, N.Y. He was the son of a poor farmer and at fourteen was apprenticed to a printer in Vermont after a meagre education. He became a journeyman compositor, finding employment in New York State and Pennsylvania printing plants, and in 1831 came to New York City where, with a partner, he later set up a small printing shop and issued the *New Yorker*, a literary weekly. This venture proved that the journeyman printer possessed editorial gifts which eventually made him famous. It led to his successful editorship of the *Jeffersonian*, a Whig campaign paper, and of the *Log Cabin*, a popular weekly. Meantime he acquired a high repute as a political writer. In 1841 he established the *New York Tribune* as an independent Whig daily and edited it with a remarkable brilliance and force for thirty years, making it a national organ of great influence. He was in Congress for a brief period, 1848-9. In 1861 he was nominated as Republican candidate for U.S. Senator from New York, but was defeated, and he met with other failures to obtain public office. Opposing the renomination of President Grant in 1872, he consented to become presidential candidate of the Liberal Republicans with the endorsement of the Democrats. Grant defeated him by over 700,000 votes, the only states he carried being Georgia, Kentucky, Maryland, Missouri, Tennessee and Texas. His death occurred before the votes were counted.

GREELY, ADOLPHUS WASHINGTON (1844), Arctic explorer and army general; *b.* Newburyport, Mass. He served throughout the Civil War as a private in a Massachusetts infantry regiment of volunteers. Later, as second lieutenant in the regular army, he was assigned to the signal corps, of which he became chief officer in 1887, ranking as brigadier-general. In 1906 he was promoted to major-general. His explorations in the Arctic began in 1881, when he commanded an expedition to establish circumpolar stations for meteorological and other purposes in that region. There were twelve in the party and they attained the highest point north then reached (83° 24′), which was in Grinnell Land. Their non-return caused a relief expedition to be sent the next year, and another in 1883, both of which failed to reach them. A third rescue party under Commander Winfield S. Schley found them in June, 1884, at Cape Sabine. Greely's men were reduced to seven, five having died through cold and famine in the 1883 winter, and the survivors were on the point of starvation. The Royal Geographical Society of London and the Societé de Geographie of Paris awarded him medals for his services to geographical science. He supervised

the development and extension of military telegraph communication, including cable and wireless, with Porto Rico, Cuba, the Philippines and Alaska, and conducted the relief measures for the San Francisco earthquake sufferers in 1906. In 1908 he retired. His writings record his various activities in the government service and include works on American weather, auroras, the California earthquake, Alaska, and polar discoveries.

GREEN, ANNA KATHERINE (1846), author; *b.* Brooklyn, N.Y.; married Charles Rohlfs, actor, in 1884. She became known to the reading public as a writer of gripping stories of mystery in 1878, when her first novel, *The Leavenworth Case* appeared, and made her famous. Thereafter numerous narratives of a similar enthralling type came from her pen in steady succession and firmly established her reputation as a writer of detective stories. Several of them were reproduced as dramas and moving pictures, including *The Leavenworth Case*. A popular feature in moving pictures was her serial scenario, *Who is Number One?* exhibited throughout the country in 1917.

GREEN, HETTY HOWLAND ROBINSON (1835-1916), an American business woman. She accumulated a large fortune in New York City, largely through shrewd investments in real estate. Property valued at $100,000,000 was bequeathed at her death to her son, Colonel E. H. R. Green, and her daughters.

GREEN, THOMAS HILL (1836-82), Eng. philosopher; ed. Rugby and Balliol Coll., Oxford; elected fellow, 1860; prof. of Moral Philosophy, 1878. His *Prolegomena to Ethics* and lectures on the *Principles of Political Obligation* were pub. after his death.

GREEN, WILLIAM HENRY (1825-1900), Amer. Hebrew scholar; wrote a *Grammar of the Hebrew Language*, and numerous works of Biblical criticism.

GREEN, WILLIAM MERCER (1876), American bishop. Graduated from University of the South, 1896. Ordained in 1900 in Protestant Episcopal Church. Rector of churches in Knoxville, Tenn.; Meridian, Miss.; Vicksburg and Jackson, Miss. Consecrated bishop coadjutor of Mississippi in 1919. Has written extensively on theological subjects for church magazines and journals.

GREEN BAY, a city of Wisconsin, in Brown co., of which it is the county seat. It is on the Chicago and Northwestern, the Chicago, Milwaukee and St. Paul, and other railroads, and on Green Bay and Fox rivers. The city is at the head of the lake and foot of river navigation. It has an excellent harbor and there is a large trade in lumber, coal, grain, flour, cheese, etc. There are several Roman Catholic and Lutheran parochial schools. A ship canal connects the Mississippi River with Lake Michigan, using the Wisconsin and Fox rivers. The cost of this was over $10,000,000. Pop. 1920, 31,017.

GREEN EARTH, popular name for various soft minerals, specially *glauconite* (*q.v.*), celadonite, and chlorite.

GREEN MOUNTAINS. See APPALACHIAN MOUNTAINS.

GREEN MOUNTAIN BOYS, a band of Vermont men who took an active part in the Revolutionary War under the leadership of Ethan Allen, and defended the frontier against attacks from Canada. The corps was raised by Allen before the revolution to resist encroachments on Vermont territory made by the authorities of New York State, who claimed rights to it. At the outbreak of the war the Green Mountain Boys seized and held the British fortresses on the New York border.

GREEN RIVER, in Kentucky, rises near the State's center in Lincoln County and flows irregularly west, south and northwest through the western coal field of Kentucky to the Ohio river, of which it is a tributary, a few miles above Evansville, Ind. It is about 300 miles long and for some 200 miles from the Ohio is navigable for small steamers.

GREEN RIVER, in Wyoming, Utah and Colorado, rises in the Wild River Mountains of West Wyoming and flows south and east into Colorado, then generally south into Utah. There it joins the Grand river, one of the main forks of the Colorado. Its course forms a number of remarkable canyons in the Uinta Mountains. It is 720 miles long and drains an area of 47,220 sq. miles.

GREENAWAY, KATE (1846-1901), an English artist and illustrator of books in London. Her father was John G., an engraver and draughtsman. She studied at South Kensington and at the Slade Schools. In 1868 she first exhibited water-color drawings at the Dudley Gallery, London. In 1873 she began to illustrate for *Little Folks*, and commenced her series of Christmas cards for Marcus Ward; they were full of quaint beauty and charm, and became extremely popular. In 1877 she began to draw for the *Illustrated London News*. The charming freshness of her illustra-

tions in her books, one of which, *Under the Window*, sold to the extent of 150,000 copies, made her famous. Her drawings of children dressed in the style of the early 19th century, are full of artistic grace and delicate quaintness. Among her best known illustrated books are: *A Birthday Book for Children, The Pied Piper of Hamlin, Mother Goose*, and *Little Ann*.

GREENBACK PARTY, a political party of the United States which favored greenbacks, or paper currency, to exchange for interest-bearing bonds. They called themselves the Independent Party. The rise in gold value of greenbacks, or paper currency after the Civil War caused much distress in the West where business was regulated to the high scale of prices prevalent in the war. The purpose of the Act of 1866 was to slowly retire greenbacks, and created much opposition. The further proposition in 1868, to make bonds, when no medium of payment was specified, paid in coin, developed the 'Ohio Idea.' This was that all bonds be paid in greenbacks at the government's option. The idea spread and controlled the Democratic Convention. Agitation over the greenback question was revived in 1874, and on November 25, a Greenback Convention met at Indianapolis to protest against the Resumption Act, and passed three resolutions: (1) All banks and corporations currency should be withdrawn, (2) That no currency be allowed except government paper and exchangeable on demand for 3.65 per cent bonds, (3) That coin should be paid only for interest on the national debt and for that part of the principal which promised it. In 1876 with hard-money, Samuel J. Tilden a prospective presidential candidate, the Greenback Party was formed and convened May 17, at Indianapolis. Peter Cooper of New York was nominated for president and Newton Booth of California for vice, but the latter declined, and was succeeded by Samuel F. Cary. Besides the three points mentioned the repeal of the Resumption Act of 1875 was demanded. In the election the Greenback vote was 81,737. In the States election the next year the vote was 187,095. The party then merged with the Greenback-Labor party.

GREENE, FRANCES NIMMO, educated at Tuscaloosa Female College. Taught for a number of years in public schools of Alabama. Has contributed largely to newspapers and magazines, short stories and other forms of fiction. Author, *King Arthur and His Court*, 1901; *Into the Night*, 1909; *The Right of the Strongest*, 1913; *The Devil to Pay*, 1917; *America First*, 1917; and *American Ideals*, 1921.

GREENE, FRANCIS VINTON (1850), army officer; *b.* Providence, R.I. Graduating from West Point in 1870, he entered the artillery as second lieutenant and was transferred to the engineers. He became major-general of volunteers in 1898. From 1877 to 1879 he served as U.S. military attaché at St. Petersburg, and was with the Russian army in the Russo-Turkish war, witnessing the decisive battle of Plevna among other engagements. He was police commissioner of New York City from 1903 to 1904. His contributions to military literature included works on Russia and her army, the Revolutionary War, Mississippi campaigns of the Civil War, and a life of General Nathaniel Greene.

GREENE, JEROME DAVIS (1874), American banker. Graduated at Harvard in 1896; Harvard Law School, 1897-99. Secretary to president of Harvard 1901-05. Secretary to Harvard corporation 1905-10; General manager Rockefeller Institute of Medical Research, 1910-12. Associated with John D. Rockefeller in management of his business and philanthropic interests, 1912-14. Secretary Rockefeller Foundation 1913-17. Member of firm of Lee Higginson & Co. since 1918. Overseer of Harvard University, 1911-13, 1917-23.

GREENE, JOHN PRIEST (1849), American college president. Graduated from La Grange College, Mo., in 1872 and from Southern Baptist Theological Seminary in 1879. Ordained in Baptist ministry in 1872. President of William Jewell College, 1892 to 1920. Author of *Commentary in Pastoral Epistles*; *The Happy Man*, and *The Ideal Man*.

GREENE, NATHANAEL (1742-86), American soldier; *b.* Patawomut, R.I. He worked as a child at the forge and on the farm, and educated himself in his spare moments. In 1770 he was chosen a member of the General Assembly for Coventry and thereafter engaged actively in public affairs. He was ardent in the cause of the Colonies against the British crown, and in 1775 was appointed as brigadier-general to command a Rhode Island contingent in the army at Boston. From that time he was not absent a day from military service until the end of the Revolutionary War. He was perhaps the ablest general of the Continental Army, next to Washington. He served with distinction at the battles of Harlem Heights, Trenton, Princeton, and Germantown. At Brandywine, his brilliant work alone preserved the army from utter destruction. From March 1778 until August 1780 he held the office of quartermaster-general, and in the latter year, resuming active

service, won a brilliant victory at Springfield. In October of that year he took command of the Southern army, which was at the time utterly disorganized, and in less than a year, regained from the enemy nearly all the territory that they had conquered in Georgia and the Carolinas. In that remarkable campaign were included the battles of the Cowpens, Guilford Court House, Hobkirk's Hill and the drawn battle of Eutaw Springs. For his services in that zone of operations Congress gave him a medal, and the states of North and South Carolina and Georgia made him valuable grants of property. He died from sunstroke in 1786.

GREENE, ROBERT (1558-92), an English author of brilliant parts whose works were conspicuous in Elizabethan literature. He belongs to the early molders of the English novel, drama and lyric. His life was disreputable, but his profligacy was little reflected in his writings, which were marked by delicacy of spirit. He was educated at Cambridge, married a woman of good family, deserted her and lived with thieves and cutthroats. Like Shakespeare, he wrote plays for the Queen's actors; also prose romances, satires, finely wrought poems and pamphlets on crime based on his own wild life. His chief dramatic works are *Friar Bacon, Friar Bungay* and *James IV. of Scotland.*

GREENE, SARAH PRATT (1856), American author. Educated at Mt. Holyoke, Mass. Author: *Cape Cod Folks,* 1881; *Some Other Folks,* 1882; *Towhead,* 1883; *Last Chance Junction,* 1889; *Vesty of the Basins,* 1892; *The Moral Imbeciles,* 1898; *Winslow Plain,* 1902; and *Power Lot,* 1906.

GREENFIELD, a town of Massachusetts, in Franklin co., of which it is the county seat. It is on the Boston and Maine railroad. The town includes two villages, Factory and North Parish. Its industries include the manufacture of shoes, cutlery, silverware, tools, snow shovels, cement blocks, rakes, baby carriages, etc. The public buildings include a library, high school, and a hospital. Pop. 1920, 15,462.

GREENGAGE, the name given to a certain kind of small round plum, grown especially for dessert. It is less hardy than some kinds, and requires shelter and a good deal of care in cultivation, which follows the same lines as those of the plum.

GREENLEAF, SIMON (1783-1853), Amer. lawyer; author of a *Treatise on the Law of Evidence,* 1842-53.

GREENLAND, Danish *Gronland* (70° N., 40° W.), large island belonging to Denmark; between Baffin Bay and Atlantic Ocean, N.E. of America; larger part in Arctic circle; stretches from 59° 45′ N., beyond 82° - 83°; extreme length, about 1650 miles; greatest breadth, about 800 miles; area, 612,000 sq. miles; interior completely buried under ice with a thickness over some valleys of 6000-7000 ft. Surface generally is mountainous; several mountains on east coast between 5000 and 8000 ft.; highest peak, Petermann's Spitze, 9000 ft., near Franz Joseph Fjord; coast-line broken by numerous bays and fjords of great depth—Scoresby (180 miles long), South Ström, Petermann Fjords, Kane Basin, Inglefield Gulf, etc; Disco, on west coast, is the largest of many islands; no large rivers; drainage mainly done by enormous glaciers, which move with surprising rapidity, and small streams of melted snow and ice; largest glaciers are Humboldt, Petowik, Jakobshaven, and Great Karajak; part of northeast and northwest coasts still unexplored. Fauna includes lemming, musk-ox, white wolf, polar bear, reindeer, fox, and hare; numerous birds; copse-woods on coast; climate colder on east coast owing to north polar current; west coast washed by Atlantic water. Principal settlements are Julianehaab (most southerly station), Frederikshaab, Godthaab, Sukkertoppen, Godhaven, Egedesminde, Kristianshaab, Jakobshaven, Umanak, and Upernivik (most northern settlement).

G. was first discovered by Norse settlers from Iceland, X. cent.; the Norwegian, Erik the Red, established two colonies, *c.* 986; under Norwegian rule, 1261; western settlements destroyed by Eskimos, XIV. cent.; rediscovered by John Davis, 1585-87, followed by Hudson, 1610, Baffin, 1616; Egede established several Dan. missionary stations on W. coast, 1721; Julianehaab founded, 1775; E. coast explored by Scoresby, 1822, Graah, 1829-30, 2nd Ger. North Pole Expedition, 1689-70, Nathorst, 1899, Amdrup, 1900. G. first crossed by Nansen (E. to W.), 1888; northern limits traced by Peary, 1892; exploration of inland ice by Nordenskiold, 1883, Von Drygalski, 1892, Garde, 1893, Mylius Erichsen, 1906-8, followed by Mikkelsen, 1909-12, explored extreme N.E. Principal exports: whale and seal oil, eiderdown, fox and seal skins; cryolite mine at Tvigtut; copper, lead, iron, zinc, are found; large cod and haddock fisheries on W. coast; trade a monopoly of Dan. Government. Pop. on coast, *c.* 13,000 (Eskimos and some 300 Danes). See MAP N. AMERICA.

GREENOCK (55° 56′ N., 4° 45′ W.), burgh, prosperous seaport and manufacturing town, on Clyde estuary, Renfrewshire, Scotland; picturesquely situated; birthplace of James Watt; head of large fishery district; shipbuilding is largely carried on, also iron-working, especially construction of boilers and engines; sailcloth and woolen factories; sugar-refining; rope-works, tanneries, etc. Pop. 1921, 81,120.

GREENOUGH, HORATIO (1805-52), sculptor; *b.* Boston, Mass.; *d.* Somerville, Mass. He modeled in clay and worked at sculpture as a boy. After his graduation from Harvard he went to Rome to study, and thereafter spent most of his life in Italy. He executed, 1843, the great statue of Washington which fronts the Capitol at Washington, D.C., and also busts of John Quincy Adams, Chief Justice Marshall, Webster, Lafayette and Clay. His work includes a number of grouped figures, notably *The Rescue*, symbolizing the triumph of civilization which was also placed in Washington.

GREENSBORO, city of N. Carolina in Guildford co., of which it is the county seat. There are three colleges here, (*viz.*) Greensborough Female College, 1846; Bennett College, and the State Agricultural College. The surrounding country produces tobacco and fruit, and the town is famous for its cotton mills and blast furnaces. Iron and copper are mined in the neighborhood. Pop. 1920, 19,861.

GREENSBURG, a city of Indiana, in Decatur co., of which it is the county seat. It is on the Cleveland, Cincinnati, Chicago and St. Louis railroad. The city is the center of an important agricultural and natural gas region, and in the neighborhood are important limestone quarries. The industries include flour mills, and a wire factory. Here is the State Odd Fellows' Home. There is a park and a public library. Pop. 1920, 5,345.

GREENSBURG, a town of Pennsylvania, in Westmoreland co., of which it is the county seat. It is on the Pennsylvania Railroad. The surrounding country is rich in coal and natural gas. The city is an important industrial community and has a plant for the making of steam heating apparatus, steel works, glass works, nut and bolt works, etc. Pop. 1920, 15,033.

GREENSLET, FERRIS (1875), grad. from Wesleyan University in 1897. Associate editor Atlantic Monthly, 1902-7. Literary adviser and director of Houghton, Mifflin and Co. since 1910. Author: *Joseph Glanville*, 1900; *The Quest of the Holy Grail*, 1902; *Walter Pater*, 1903; *Life of Lowell*, 1905; and *Life of Thomas Bailey Aldrich*, 1908.

GREENVILLE, a city of Mississippi, in Washington co., of which it is the county seat. It is on the Yazoo and Mississippi Valley, and the Southern and Mississippi railroads, and on the Mississippi river. It is connected by steamboat with various parts of the river. There is a large trade in cotton, and the industries include cottonseed oil mills, cotton compresses, and lumber mills. The public institutions include parks and playgrounds and a public library. Pop. 1920, 11,560.

GREENVILLE, a city of North Carolina, in Pitt co., of which it is the county seat. It is on the Norfolk Southern, and the Atlantic Coast railroads, and on the Tar river. The city is the center of an important tobacco, cotton, and corn growing district, and its industries include tobacco factories, cotton mills, and cottonseed oil mills. It is the seat of the East Carolina Teachers' Training School. Pop. 1920, 5,772.

GREENVILLE, a city of Ohio, in Darke co. It is on the Cincinnati Northern, Dayton and Union, and the Pittsburgh, Cincinnati, Chicago and St. Louis railroads, and on Greenville creek. It has grain elevators and several industrial establishments. It is famous as being the scene of the signing of a treaty between the Indians and General Anthony Wayne. Pop. 1920, 7,104.

GREENVILLE, a borough of Pennsylvania, in Mercer co. It is on the Pennsylvania, the Erie, and the Bessemer and Lake Erie railroads, and on the Shenango river. It has important industries including plants for the making of bridge iron, flour, foundry and machine shop products, steel products, etc. There are also railroad shops, and bridge works. The borough is the seat of Thiel College. Pop. 1920, 8,101.

GREENVILLE, a city of South Carolina, in Greenville co., of which it is the county seat. It is on the Southern and the Charleston and West Carolina railroads. Its industries include the manufacture of cotton, wagons, underwear, etc. The city is the seat of Furman University, Greenville College for Women, Chicora College, and Greenville Female College. There is also a military institute and a business college. Pop. 1920, 23,127.

GREENVILLE, a city of Texas, in Hunt co., of which it is the county seat. It is on the Missouri, Kansas

and Texas, the Texas Midland, and the St. Louis Southwestern railroads. The surrounding region is an extensive agricultural area. The industries include cottonseed oil mills and cotton compresses. It is the seat of Burleson College, Wesley College, and Holiness University. Pop. 1920, 12,384.

GREENWICH (51° 28′ N., 0°), parliamentary borough, county of London, England, on S. bank of Thames; has celebrated Royal Observatory in G. park. G. Hospital (handsome building on site of royal palace) was made hospital for seamen by William and Mary; now Royal Naval Coll. Pop. 1921, 102,000.

GREENWICH, a borough of Connecticut, in Fairfield co. It is a residential community and has many beautiful private residences. The borough is in a town of the same name. Pop. of town 1920, 22,123.

GREENWOOD, a city of Mississippi, in Le Flore co., of which it is the county seat. It is on the Southern, and the Yazoo and Mississippi Valley railroads. The city is the center of an extensive cotton growing region and its industries include the manufacture of oil, cotton compresses, wagons, lumber, ice, etc. There is a Carnegie library, an Elks home and a court-house. Pop. 1920, 7,793.

GREENWOOD, a city of South Carolina, in Greenwood co., of which it is the county seat. It is on the Seaboard Air Line, the Piedmont and Northern, and other railroads. Its industries include the manufacture of lumber, cottonseed oil, cotton, spools, etc. Here is Brewer Normal School for Negroes, the Lander Female College, and Bailey Military Institute. Pop. 1920, 8,703.

GREER, DAVID HUMMELL (1844-1919), Episcopal bishop; *b.* Wheeling, W. Va.; *d.* New York City. He studied theology at Gambier Episcopal Seminary, Ohio, after graduating from Washington College, Pa., in 1862, and was ordained in 1868. His first ministries were in the South. Following them came a long tenure, 1871-85, of the rectorship of Grace Church, Providence, R.I., which he resigned to become rector of a leading church in New York City, St. Bartholomew's. In 1904 he was elected bishop-coadjutor of New York after declining three other bishoprics. He became head of that diocese in 1908, succeeding Bishop Potter, and held the office to his death.

GRÉGOIRE, HENRI (1750-1831), Fr. politician and ecclesiastic; sided with Third Estate, 1789; bp. of Blois, 1790; advocated destruction of royal authority, but tried to prevent king's execution; wrote *Memoires, Historie des Sectes Religieuses,* and other works.

GREGORAS, NICEPHORUS (fl. 1300 - 60), Byzantine historian; his *Roman History* covers the period, 1204 to his death.

GREGORIAN CALENDAR. See CALENDAR.

GREGORIAN CHANT. See MUSIC.

GREGOROVIUS, FERDINAND (1821-91), Ger. historian; principal work, *History of the City of Rome in the Middle Ages,* 1859-72

GREGORY, name borne by sixteen popes and one antipope. The most important were the following:—

Gregory I., Saint, surnamed the Great (*c.* 540-604), was *b.* at Rome; inherited great wealth, which he devoted chiefly to service of Church; became a monk in one of monasteries founded by himself. Elected pope in 590. His *Liber Pastoralis* was one of the works trans. into Anglo-Saxon by order of Alfred the Great. His name is traditionally associated with *Gregorian chants.* G. was last Latin Father of Church.

Gregory II., Saint (*d.* 731); *b.* Rome; when deacon accompanied Pope Constantine to Constantinople as canonist; became pope, 715; sent St. Boniface as missionary to Germany; opposed the Gk. emperor's (Leo III.'s) taxation and proscription of image-worship.

Gregory VI. (*d.* 1047); archpriest of San Giovanni by the Latin Gate, and godfather of the profligate Benedict IX., from whom in innocence bought Papacy, 1045; deposed, 1046, for simony, and exiled to Germany; man of great learning and uprightness.

Gregory VII., Hildebrand (*c.* 1020-85), was the pope who did most to establish ecclesiastical supremacy of the Papacy, and laid foundations of its temporal power. Before his election as pope in 1073, he had directed the policy of the four preceding popes, had managed to place their election entirely in hands of cardinals, and was in reality the most prominent and influential man in the Church. With Henry IV., Holy Rom. emperor, who took oath of obedience in 1074, and subsequently repudiated it, he took a high-handed course; he deposed the simoniacal prelates appointed by the emperor and cited him to appear at Rome. When Henry retorted by getting his supporters to pronounce Hildebrand deposed, the latter excom-

municated Henry; and the emperor found it necessary, in order to avoid deposition, to do penance at Canossa in Italy in 1077.

Gregory VIII. (*d.* 1121), antipope, 1118; banished from Rome in 1121.

Gregory VIII. (*d.* 1187), was pope for short time in 1187; concluded treaty of peace with Emperor Henry VI., and began to make arrangements for a crusade, but died before these were completed.

Gregory IX. (*d.* 1241), was elected pope, 1227. His pontificate is marked by long struggle against Emperor Frederick II., whom he excommunicated 1227. Dispute was afterwards renewed, and emperor again excommunicated in 1239. Frederick then prepared to besiege Rome, and was marching towards the city, when G. died.

Gregory X. (1208-76) was member of Visconti family; went on crusade; elected pope 1271; reunited Eastern and Western Churches.

Gregory XI. (1330-78) was elected to Papacy in 1370; retransferred papal see to Rome in 1397; tried to suppress heresy and to reform religious orders.

Gregory XIII. (1502-85), was elected pope, 1572; founded Jesuit College at Rome; reformed calendar (*q.v.*), 1582; strongly opposed heresy; built Gregorian Chapel at St. Peter's.

Gregory XVI. (1765-1846), was elected pope, 1831; an autocrat, he discouraged democracy on principle, but encouraged learning and research in all directions.

GREGORY, AUGUSTA, LADY (1853) an Irish author and playwright, born in Roxborough county Galway. She was one of the founders and chief supporter of the Irish National Theatre movement, and was the author of many plays, some of which were produced. She also published several books of poems and translations.

GREGORY, EDWARD JOHN (1850-1909), Eng. artist; Pres., R.W.S., 1898; excellent technique.

GREGORY, ST. (*c.* 213-70), bp. of Neocæsarea from 240; an energetic prelate and theologian; much increased the Church's strength during his episcopate.

GREGORY, ST., OF NAZIANZUS (329-89), called (like St. John) 'the Theologian'; wrote five orations, delivered against Macedonians and Eunomians in 379. G. was scarcely an original thinker, but a graceful and powerful expounder; also wrote poems and letters to Basil, bp. of Cæsarea. These two, with Gregory of Nyssa, are known as *Cappadocian fathers.*

GREGORY, ST., OF NYSSA (*c.* 331-86), bp. of Nyssa; one of 'Cappadocian fathers'; wrote many works, perhaps best is his *Catechetical Oration.*

GREGORY, ST., OF TOURS (530-94), theologian and historian; ordained 563; chosen bp. of Tours by people, 573; took part in various political quarrels of Merovingian kings; wrote several theological works, but greatest work is *History of the Franks.*

GREGORY, THE ILLUMINATOR (*fl.* 290), saint and abp. of Cæsarea; his history is partly legendary; said to have been brought up in Christian faith at Cæsarea.

GREGORY, THOMAS WATT (1861), lawyer; *b.* Crawfordsville, Miss. He was educated at the universities of Virginia and Texas and admitted in 1885 to the bar of the latter State, where he established a law practice in Austin. The State engaged him as counsel in prosecuting cases against its anti-trust laws, and in 1913 he had charge of the investigation and prosecution of the New Haven railroad as a special Assistant Attorney General of the federal government. From 1914 to 1919 he was Attorney General in President Wilson's cabinet, thereafter resuming law practice in New York City.

GREIZ (50° 39′ N., 12° 13′ E.), town, Germany, capital of Reuss (the Elder), on White Elster; woolen manufactures. Pop. 23,000.

GRENADA (12° 5′ N., 61° 40′ W.), one of Brit. W. India Islands, most southerly of Windward (*q.v.*) group; mountainous; several crater lakes and mineral springs; very fertile, good climate; chief products—cocoa, fruit, spices, wool; capital, St. George; colonized by Fr., 1650; taken by British, 1762; held by French, 1779-83, then ceded to Britain. Area, 133 sq. miles. Pop. 1921, 75,663.

GRENADE, earliest form of modern explosive shell. It was a ball of metal, or strong glass, filled with explosives, and exploded by a fuse; thrown by hand. See Bombs.

GRENADIER, originally the name applied to the soldiers of a company attached to each regiment, who led the assault on trenches and ortresses, and hurled hand *grenades.*

GRENADINES (12° 45′ N., 61° 15′ W.), group of small islands, Brit. West Indies, between islands of Grenada and St. Vincent, and forming dependency of these islands; exports corn and cattle. Pop. *c.* 7,000.

GRENFELL, (SIR) WILFRED THOMASON (1865), English missionary and explorer; *b.* Parkgate, near Chester, England. He was educated at Marlborough College of the University of London and Oxford University. He practiced medicine for some years in London, and in 1892 went to Labrador as superintendent of the Labrador Medical Mission, to which he has ever since devoted his life and labors. His daring and self sacrifice have earned him an international reputation. He has written voluminously concerning the work in which he was engaged. His publications include: *Off the Rocks*, 1906; *A Man's Faith*, 1908; *Labrador*, 1909; *Down to the Sea*, 1910; *What the Church Means to Me*, 1911; *On Immortality*, 1912; *The Attractive Way*, 1913; *The Prince of Life*, 1914; *Labrador Days*, 1919. He has contributed largely to religious and secular magazines and has written an autobiography under the title of *A Labrador Doctor*.

GRENOBLE (45° 12′ N., 5° 42′ E.), town, France, on river Isère; capital of Isère department; ancient *Gratianopolis*; old capital of Dauphiné; ceded to France, 1349; a Prot. stronghold; beautiful situation among mountains, near famous Chartreuse Monastery (*q.v.*); first-class fortress; has univ. and cathedral; manufactures kid gloves, liquor, cement, straw hats, etc. Pop. 1921, 77,409.

GRENVILLE, GEORGE (1712-70), Brit. prime minister, 1763; attacked liberty of press in Wilkes' case, 1764; carried out imposition of Stamp Tax in colonies, 1765, the immediate cause of America's secession.

GRENVILLE, SIR RICHARD (*c.* 1541-91), Eng. mariner; commander of *Revenge* in expedition against Azores, 1591; had celebrated fight for fifteen hours against fifteen Span. ships; *d.* shortly after action.

GRESHAM, SIR THOMAS (1519-79), Eng. merchant; helped to consolidate and improve Eng. trade by building Royal Exchange, 1566-71; devoted much of his wealth to educational and charitable purposes.

GRESHAM, WALTER QUINTON (1832-95), statesman and jurist; *b.* Harrison County, Ind.; *d.* Washington, D.C. He studied at the Indiana State University, read law in Corydon, Ind., and was admitted to the bar in 1853. He served with distinction in the Civil War as lieutenant colonel of an Indiana regiment, being promoted by Grant and placed in charge of a brigade at Vicksburg. He also commanded a division in Sherman's march to the sea, and in 1864 retired as major-general of volunteers after being seriously wounded and disabled from service. In 1869 he was appointed a judge of the federal circuit court and in 1882 became postmaster-general. Two years later he was Secretary of the Treasury for a brief period, and again became a circuit judge. In 1893 President Cleveland made him his Secretary of State.

GRESSET, JEAN BAPTISTE LOUIS (1709-77), Fr. poet and dramatist; famed chiefly for his humorous poem, *Vert Vert*, 1734; *Oeuvres Completes*, 1811.

GRETNA, a city of Louisiana, in Jefferson parish, of which it is the parish seat. It is on Morgan's, Louisiana and Texas, the Texas and Pacific, and other railroads. It has important industries including the manufacture of cottonseed oil, lard, soap, barrels, fertilizers, etc. Here is a Catholic college. The public buildings include a court-house. Pop. 1920, 7,197.

GRETNA GREEN (55° N., 3° 3′ W.), village, Dumfriesshire, Scotland, near the Border; long famous for 'runaway' marriages—Eng. couples taking advantage of the greater ease with which the marriage ceremony could be performed in Scotland.

GREUZE, JEAN BAPTISTE (1725-1805), Fr. artist; famed for his genre pictures and female studies. His works, as a rule, have a moral tendency; among best known are *The Broken Pitcher* (Louvre), *Girl with Doves* (Wallace Collection), and *Girl with Dead Canary* (Scot. National Gallery).

GREVILLE, CHARLES CAVENDISH FULKE (1794-1865), Clerk of the Council in Ordinary, 1821-65; is famed for his *Memoirs*, pub. 1875-87, valuable for sidelights on social and official life in the first half of XIX. cent.

GRÉVY, FRANÇOIS PAUL JULES (1807-91), President of the French republic, *b.* at Moot-sous-Vaudrey Jura, and studied law in Paris, becoming an advocate in 1837. In 1848 he was elected by the republicans of his department to the constituent assembly, of which he became vice-president. He vigorously opposed the second empire under Louis Napoleon, and confined his attention to the bar till 1868, when he was returned as deputy for the Jura, and was elected president of the national assembly in 1871, being re-elected in 1876, 1877, and 1879. On the resignation of Marshal MacMahon in 1879, he was elected president of the republic. In 1885 he was re-elected for a further period of seven years, but, on the dis-

covery of his son-in-law Daniel Wilson's dishonest traffic in the decorations of the Legion of Honor, he was obliged to resign office.

GREW, JOSEPH CLARK (1880), American diplomat. Graduated from Harvard in 1902. Deputy consul-general, Cairo, Egypt, 1904-06. 3rd Secretary of Embassy, Mexico City, 1906-7; St. Petersburg, 1907-8; Secretary, Embassy Berlin, 1912-16. Counsellor of Embassy at time of break of diplomatic relations with Austria-Hungary, Vienna, 1917. Secretary General of American Commission to negotiate peace, 1918. Appointed envoy and minister to Denmark in 1920 and to Switzerland in 1921. Author, *Sport and Travel in the Far East*, 1910.

GREY, CHARLES, 2ND EARL GREY (1764-1845), Brit. politician; *b.* at Falloden, Northumberland; First Lord of Admiralty, 1806; after Fox's death became Foreign Sec. in 'All the Talents' ministry; succ. to earldom, 1807; carried act abolishing African slave trade. G. became Prime Minister in 1830; the Reform Bill was introduced by Lord John Russell, 1831, and carried, 1832, by G.'s obtaining royal permission to create sufficient peers to ensure its passing; retired, 1834.

GREY OF FALLODON, EDWARD, 1ST VISCOUNT (1862), Brit. statesman. Appointed under-secretary for foreign affairs, 1892-5, with Rosebery as his chief; secretary of state for foreign affairs, 1905-16. In 1907 concluded Anglo-Russian agreement, which settled outstanding Asiatic rivalries. Added to his reputation during Morocco crisis, 1909, and by inducing the belligerents in the Balkan War to sign the Peace of London, May 30, 1913. His earnest efforts to preserve peace after the Austrian ultimatum to Serbia are set forth in the White Paper issued in Aug. 1914. On Aug. 1 defined Britain's attitude in a masterly speech. Impaired vision necessitated a brief retirement from active duties in June 1915; cr. viscount, July 1916. On Asquith's resignation, Dec. 1916, Viscount Grey retired from Foreign Office. Lord Rector of Edinburgh Univ. 1920.

GREY FRIARS. See FRANCISCANS.

GREY, SIR GEORGE (1812-98), Brit. Colonial administrator, politician, and bibliophile; led exploring expeditions in N.W. and Western Australia, 1837-38; gov. of S. Australia, 1841, of New Zealand, 1846, conciliating the Maoris; gov. of Cape Colony, 1854-61; tried to federate South African States; crushed Kaffir revolt; gov., New Zealand, 1861; ended Maori War, 1870; premier of New Zealand, 1877-84.

GREY, HENRY, 3RD EARL GREY (1802-94), Brit. politician; M.P., 1826; Colonial Under-Sec., 1832; War Sec., 1835; Colonial Sec., 1846-52; advocated emancipation of slaves; established free trade between colonies and mother country; opposed Crimean War.

GREY, LADY JANE (1537-54), Eng. 'Nine days' Queen'; granddau. of Henry VIII.'s sister Mary; early acquired wide knowledge of classical and modern languages; *m.* Lord Guildford Dudley, whose *f.*, Duke of Northumberland, proclaimed her Queen in 1553; but on Mary's accession she was sent to Tower; beheaded, 1554.

GREY, ZANE (1872), author; *b.* Zanesville, Ohio, where he received a high school education, studying later at the University of Pennsylvania. He came to New York City and in 1904 embarked on a literary career with the publication of *Betty Zane*, a novel of Western life and the forerunner of a number of like stories of the plains, desert, lonely trails and forests, which earned him considerable popularity. In 1921 appeared *The Call of the Canyon*; in 1922, *The Vanishing American*, and in 1923, *Wanderer of the Wasteland*.

GREYHOUND, dog of Eastern origin, thoroughbred racer; run in many coursing meetings in this country; Scotch, Italian, Irish, and English breeds.

GREYTOWN (1) called also San Juan del Norte, a tn. and port of Nicaragua on the Caribbean Sea, at the mouth of the San Juan R. It is a port of call for mail packets, and monopolizes the import and export trade of the country. Pop. 2,500. (2) A tn. of Natal in the Umvoti Valley, 65 m. S.W. of Pietermaritzburg. Pop. 2,400.

GRIDLEY, CHARLES VERNON (1845-98), naval officer; *b.* Logansport, Ind.; *d.* Kobe, Japan. He graduated from the U.S. Naval Academy in 1863, when he joined the sloop-of-war *Oneida* and shared in the operations of the West Gulf Squadron in the Civil War. He was an instructor at the Naval Academy from 1875 to 1879 and subsequently filled various naval posts until 1897, when he became captain and was assigned to command the *Olympia*, flagship of the Asiatic squadron. Admiral Dewey, who commanded the squadron, made him one of his chief advisers. The Olympia took part in the battle of Manila Bay in the Spanish-American War of 1898, and Gridley was seriously injured while conducting her fight from

the conning tower. He died a few weeks after.

GRIEG, EDVARD HAGERUP (1843-1907), Nor. composer and pianist; of Scot. descent; *b.* Bergen; studied at Leipzig under Richter and Reinecke; Copenhagen, under Gade; excelled in shorter pianoforte pieces and songs; most popular work, *Peer Gynt* music.

GRIERSON, SIR JAMES MONCRIEFF (1859-1914), Brit. general; distinguished himself in S. African War at capture of Johannesburg and Pretoria, 1900; on Count Waldersee's staff in China, 1900-1; sent to France to command a corps in the World War, 1914, but died before taking up duties; wrote *The Armed Strength of Russia, Germany, and Japan*; *Staff Duties in the Field*, 1891; *Records of the Scottish Volunteers*, 1909.

GRIFFIN, a city of Georgia, in Spalding co., of which it is the county seat. It is on the Central of Georgia and Southern railroads. Its industries include the manufacture of cotton and towels. Here is a State Agricultural Experiment Station. Pop. 1920, 8,240.

GRIFFIN, GERALD (1803-40), Irish novelist; author of *The Collegians*, 1829, upon which Boucicault founded *The Colleen Bawn*; also other novels, plays, and lyrics.

GRIFFIN, GRYPHON, mythical monster which was said to guard the earth's treasures. It is usually represented as having the body and hind legs of a lion and the wings and beak of an eagle; a figure in heraldry.

GRIFFIS, WILLIAM ELLIOT (1843), Congregational minister and Oriental authority; *b.* Philadelphia, Pa. He saw service in the Civil War, after which he studied at Rutgers College and in 1870 went to Japan to apply American methods to schools there. From 1872 to 1874 he was professor of physical sciences at the Imperial University, and introduced technical education into Japan. Returning to the United States, he studied for the ministry, graduating from the Union Theological Seminary in 1877, and filled pastorates until 1903, when he turned to literature to promote a better understanding of Oriental civilization. His publications chiefly embrace works on Japan, China and Corea.

GRIFFITH, ARTHUR (1872-1922), President of the Irish Parliament and founder of Sinn Fein; *b.* Dublin; *d.* there. He was the son of a Roman Catholic compositor who belonged to an old Irish family, despite his supposedly Welsh name, and began life setting type and reading proofs on a Dublin newspaper. While at this work he acquired an acquaintance with foreign languages, metaphysics, mathematics, science and history. He revised school books, and had an ambition to become a philologist and compile a polyglot dictionary. He managed to get abroad, studying at a continental university, and wandered as far as South Africa, where he worked in a diamond mine. After a study of European conditions, especially the Magyar problem in Austria-Hungary, he returned to his native land about 1890 swayed by the belief that Ireland must solve her troubles by taking her cue from the Magyars. He established his famous weekly, the *United Irishman*, which was frequently suppressed, and in 1905 founded the Sinn Fein (*Ourselves*) organization and launched its principle as a national doctrine.

The new patriotic organization did not make much headway until 1916, when the undercurrents of its strength came to the surface and produced the Easter rebellion of that year. The Sinn Fein party swept the Irish elections in 1918, and elected him member of Parliament for Cavan. He was an outstanding figure in the subsequent negotiations with the British Government for securing Irish independence to end the revolutionary struggle and bloodshed that rent Ireland after Sinn Fein's triumph at the polls. With the establishment of an Irish Parliament, he was elected President of the Dail Eireann in January, 1922, after the republican leader, De Valera (*q.v.*) and his followers had deserted the House. He died the following August.

GRIFFITH, DAVID (LEWELYN) WARK (1880), a moving picture director, *b.* in La Grange, Ky. He was educated in the public schools and for several years was on the stage as an actor. He first took part in moving pictures in 1908 as an actor and then became a director. He was among the first of the moving picture directors to show appreciation of the possibilities of the screen and his productions were of unusual excellence. They include, *Birth of a Nation*, *Broken Blossoms*, and *Orphans of the Storm*. During the World War he was chairman of the War Cooperative Commission.

GRIFFITH, SIR RICHARD JOHN (1784-1878), Irish geologist; carried out boundary survey of Ireland, completed, 1844.

GRIGGS, EDWARD HOWARD (1868), educator and lecturer; *b.* Owatonna, Minn. He graduated from Indiana University, where he also taught Eng. literature, 1889-91. After-

wards he became professor of that department, serving for two years, meantime giving instruction in ethics at Leland Stanford. He was professor of ethics at the latter university from 1893 to 1897, later heading the department of education as well. In 1899 he became known as a university lecturer, giving extension courses throughout the United States and Canada, and also as a writer. He lectured on Dante, great autobiographies, Italian cities, human progress, Maeterlinck, moral leaders, Plato's philosophy and Browning, his lectures on these and other subjects being afterwards published in a series of handbooks. He also edited and contributed to B. W. Huebsch's *Art of Life* series. His more lengthy works include *Moral Education*, *The New Humanism*, *Philosophy of Art*, and *The Soul of Democracy*.

GRIGGS, JOHN WILLIAM (1849), lawyer; *b.* Newton, N.J. He began practicing law in Paterson, N.J. after his graduation from Lafayette College in 1868 and his admission to the bar in 1871. He was a member of the New Jersey legislature from 1876 to 1888, serving both in the general assembly and senate, and in 1896 became governor of the State, resigning in January, 1898, when President McKinley appointed him to his cabinet as Attorney General. He relinquished that office in 1901 to join the Permanent Court of Arbitration at The Hague and officiated as a member of that tribunal till 1908. Later he resumed the practice of law in New York City and became identified with large business interests.

GRILLE (Fr.), metal screen or grating; usually fitted into a door for purpose of observation.

GRILLPARZER, FRANZ (1791-1872), Austrian dramatist and poet; regarded as perhaps the greatest dramatic poet of his country; his plays include *Sappho*, 1819; and *Das Goldene Vlies*, 1821; *Konig Ottokar's Gluck und Ende*, 1825; *Des Meeres und der Liebe Wellen*, 1840, and others.

GRIMALDI, GIOVANNI FRANCESCO (1606-80), Ital. artist and architect; hist. subjects, portraits, and landscapes; architect to the popes.

GRIMM, FRIEDRICH MELCHIOR, BARON VON (1723-1807), Ger. author; famed for his *Correspondance Litteraire*, an invaluable commentary on contemporary events; lived mostly in Paris.

GRIMM, JACOB LUDWIG KARL (1785-1863), Ger. philologist; *b.* at Hanau; first important appointment was that of librarian to King Jérôme at Wilhelmshöhe in 1806. In 1816 he joined his bro., Wilhelm Karl, 1786-1859, at the Cassel library as sub-librarian. The lives of the bro's were devoted to a scientific study of the Ger. languages and folk-lores, and their researches were epoch-making. They collaborated in the famous collection of fairy-tales. Jacob wrote a *Deutsche Grammatik*, *Geschichte der Deutschen Sprache*, and a *Deutsche Mythologie*.—Grimm's Law, term loosely applied to rules regulating 'consonantshift' in various Indo-European languages. The elder G. applied it to the change into Teutonic dialect, then into High German, (*e.g.*) Lat. *pater*, English (from Teuton dialect) *father*, German *vater*; Latin *tu*, English *thou*, German *du*.

GRIMM'S LAW. See GRIMM, JACOB L. K.

GRIMSBY, GREAT GRIMSBY (53° 34′ N., 0° 4′ W.), seaport, on Humber, Lincolnshire, England; important commerce; chief fishing port in country; has docks covering area of about 150 acres. Industries include shipbuilding, brewing, tanning, flax-dressing. Pop. 1921, 83,600.

GRIMSEL PASS, situated in the Bernese Alps, Switzerland. It is over 7,000 ft. high, and leads to the valley of the Aar, being crossed by a carriage road. At the foot of the pass is the Grimsel Hospice. It was here that the French were victorious over the Austrians in 1799.

GRINDAL, EDMUND (*c.* 1519-83), Eng. abp.; engaged in religious disputation, 1549; was one of clerics who examined the Forty-two Articles, 1552; cr. bp. of London, 1559; abp. of York, 1570; of Canterbury, 1575.

GRINDING. See ABRASIVES.

GRINGOIRE, PIERRE (*c.* 1480-1539), Fr. poet and dramatist; author of satirical comedies directed against Pope Julius II., the enemies of Louis XII., and the vices of society; subject of play by T. de Banville.

GRINNELL, a city of Iowa, in Poweshiek co. It is on the Chicago, Rock Island and Pacific, and the Minneapolis and St. Louis railroads. Its industries include the manufacture of gloves, washing machines, aeroplanes, carriages, etc. There is a public library. The city is the seat of Grinnell College. Pop. 1920, 5,362.

GRINNELL, GEORGE BIRD (1849), ethnologist and author; *b.* Brooklyn, N.Y. He graduated from Yale in 1870 and from 1874 to 1880 was assistant in osteology at the Peabody Museum,

New Haven, Conn. He edited *Forest and Stream* from 1876 to 1911, and for most of that period was also its president. In 1886 he founded the Audubon Society. His publications embrace about twenty volumes, chiefly on ethnological subjects relating to the Indians and the early West.

GRINNELL LAND, an Arctic region above Baffin Bay and adjacent to the northwest part of Greenland, from which it is divided by Kennedy Channel. A large portion of this tract is known in Europe as Ellesmere Land; the remainder, to the north, is called Grant Land. The name of Grinnell Land has also been attached to a tongue of land stretching to the northwest of North Devon, an island to the south of Ellesmere Land. The regions were so named in honor of Henry Grinnell, who equipped two American expeditions in search of Sir John Franklin in 1850 and 1853. With Greenland the larger Grinnell Land is the most northerly region of the earth. It has a snow-free area in summer of 1,000 sq. miles, covered with luxuriant vegetation. The fox, wolf, musk-ox, reindeer, ermine and hare are among its fauna. Peary visited it in 1898-9. In 1881-4 Lieut. Greely, U.S.A., afterwards rescued by Commander Schley, went up Kennedy Channel and explored Grinnell Land westward.

GRIQUALAND EAST and **GRIQUALAND WEST,** divisions of the Cape Province, Union of South Africa.

GRISELDA, GRISELDIS, female character, immortalized by her patience and virtue, in Boccaccio's *Decameron*; derived thence by Chaucer (*Clerkes Tale*); subject of a ballad, *Patient Grissel*, 1565.

GRISI, GIULIA (1811-69), Ital. prima donna; sang in Paris, London, and New York.

GRISONS (46° 40′ N., 9° 30′ E.), most easterly canton of Switzerland; largest, but most thinly populated; chief town, Coire or Chur. Juf and St. Moritz are among highest villages in Alps. Principal industry, cattle breeding; maize and chestnuts grown; wine produced; mineral springs found; climate severe. Canton is visited yearly by great numbers of tourists, especially at Davos, Arosa, and Engadine; has few railways, but many fine roads. Ger., Ital., and Romansch dialects spoken. Pop. 1920, 119,854.

GRISWOLD, ALEXANDER VIETS (1766-1843), Episcopal bishop; *b.* Suns bury, Conn.; *d.* Boston, Mass. He was ordained in 1795. For twenty-six years, 1804-30, he was rector of St. Michael's Church, Bristol, R.I. and the following five years of St. Peter's, Salem, Mass. In 1811 he became the first bishop of the eastern diocese of the Episcopal Church as then organized, officiating as such in conjunction with the rectorships he held.

GRISWOLD, RUFUS WILMOT (1815-57), Amer. editor; pub. *Poets and Poetry of America*, 1842, and other anthologies; also biographical and critical editions of Poe and other writers.

GRISWOLD, SHELDON MUNSON (1861), American bishop. Graduated from Union College in 1882 and from the General Theological Seminary in 1885. Ordained in 1885. Rector of churches in Ilion, N.Y., Little Falls, N.Y., and Hudson, N.Y. Elected missionary bishop of Salina in 1902. Suffragen bishop of Chicago, in 1917.

GRIZZLY BEAR. See BEAR.

GROAT, mediæval, thick, silver coin, worth four-pence, first issued in England in XIV. cent., and in circulation until latter half of XVII. cent.

GROCYN, WILLIAM (*c.* 1446-1519), Eng. scholar and ecclesiastic; Gk. lecturer at Oxford; prebendary of Lincoln, 1485.

GRODNO. (1) Prov., Poland, was annexed by Russia after Polish 'partition', 1795; surface flat, covered with forests, chiefly pine, and swamps; chief rivers, Niemen, W. Bug, Narev, and Bobr; center of woolen industry. Area *c.* 14,900 sq. m.; pop. 2,000,000. (2) Fort. tn. (53° 40′ N., 23° 50′ E.), on Niemen, 533 m. by rail from Petrograd; important railway and road junction; anc. palace of Polish kings and more modern palace built by August III.; manufactures tobacco and has considerable trade in timber. Pop. 34,916. In Feb. 1915 the Germans reached the Niemen, N. of Grodno, and on Sept. 2 the fortress fell after a brief defense by the Russian rearguard.

GROIN, in human anatomy the fold between the lower part of the abdomen and the thigh; in arch. the curve formed by the intersection of two arches.

GROLL, ALBERT LAREY (1866), American painter. Educated at Royal Academy, Munich. Was a landscape artist and has been awarded many prizes and metals including St. Louis Exposition, 1904; Buenos Aires and Santiago Expositions, 1910; Inness Gold Medal, 1911; San Francisco Exposition, 1915. His works are to be seen in the Corcoran Art Gallery, Washington; Minneapolis Museum; National Gallery, Washington;

New York Water Color Club and various other galleries of the country.

GRONINGEN (53° 13′ N., 6° 35′ E.), province, N.E. Holland; low and flat; rich pastures; climate damp; chief occupation dairy-farming and grazing; some fishing and boat-building. Area, 909 sq. miles. Pop. 363,589.

GRONINGEN (53° 13′ N., 6° 34′ E.), town, Holland; capital of G. province, at junction of Drentsche Aa and Hunse; Martini-kerk, 1477, Brœder-kerk, town hall, antiquity museum, univ. 1614, fine art academy and many XVI.- and XVII.-cent. houses. Pop. 1921, 89,895.

GRONNA, ASLE J. (1858-1922), U.S. Senator and farmer; *b.* Elkader, Iowa. He became identified with agriculture and banking pursuits in the Dakotas for many years and was politically affiliated with North Dakota, to whose territorial legislature he was elected in 1889. After serving in the U.S. House of Representatives from 1905 to 1911 as a member from that State, he was selected as Senator to fill the vacancy caused by this death of Martin N. Johnson. He was re-elected for the term 1915-21, and at its expiration retired through failing health.

GROS, ANTOINE JEAN, BARON (1771-1835), a French painter, *b.* in Paris, was the son of a miniature painter. He studied first at David's studio, and afterwards traveled in Italy where he became acquainted with Napoleon Bonaparte, having been introduced by Josephine. He was given an official position by Bonaparte and became a military painter. In 1824 he was made a baron by Charles X. for his paintings in the Pantheon. He committed suicide by throwing himself in the Seine. His best pictures are: *Bonaparte at the Bridge of Arcole*; *Napoleon visiting the Plague-stricken at Jaffa*; *The Battle of Eylau*; *The Meeting of Charles V. and Francis I.*, and among his classic style, *Hercules and Diomedes.*

GROSBEAK, the name applied to some of the species of the family Fringillidæ, belonging to the order Passeriformes, and including the various kinds of finches. In these birds the beak is stout and very much developed. Among the species may be mentioned the Pine G. (*Pyrrhula enucleator*), found in the regions of the N., and the Hawfinch (*Coccothraustus vulgaris*), occasionally found in Britain.

GROSS, SAMUEL D. (1805-84), an American surgeon, *b.* at Easton, Pa. He was for many years professor of surgery at the Jefferson Medical College, Philadelphia, and was the author of many books on surgery. In 1861 he was president of the American Medical Association.

GROSSMITH, GEORGE (1847-1912), Eng. comedian; associated with the operas of Gilbert and Sullivan.

GROSSTESTE, ROBERT (*c.* 1175-1253), an English scholar. He studied at Oxford and Paris and became a master of Hebrew and Greek languages. He was lecturer at Oxford for many years and his reputation for learning spread throughout Europe. In 1235 he was elected Bishop of Lincoln, but quarreled with Pope Innocent IV. on the question of bestowing English benefices on foreigners. He wrote much and some of his writings have been published.

GROSSWARDEIN (Hungarian *Nagyvarad*), an old tn. of Hungary, cap. of Bihar, on the Rapid Körös, about 150 m. S.E. of Budapest. It contains an old fortress and many public buildings, among them two bishops' palaces, as it is the seat of both Roman Catholic and Greek Catholic bishops. Near to this town are hot mineral springs. Pop. 65,000.

GROSVENOR, EDWIN AUGUSTUS (1845), historian and college professor; *b.* Newburyport, Mass. He was a graduate of Amherst College and from 1873 to 1890 occupied the chair of history at Robert College, Constantinople. He returned to Amherst in 1892 as professor of European history, and later of modern government. He also taught history at Smith College. His publications include translations from the French on historical subjects, works on Constantinople, and a survey of contemporary history.

GROSVENOR, GILBERT HOVEY (1875), geographer and editor; *b.* Constantinople, Turkey. In 1890 he graduated from Robert College, Constantinople, and later studied at Amherst. In 1903 he was appointed editor of the National Geographic Magazine after serving as assistant and managing editor, meantime also becoming a director of the National Geographic Society. He wrote on modern explorations and on Peary's polar expeditions and edited *Scenes from Every Land.*

GROTE, GEORGE (1794-1871), Eng. historian; *b.* at Clay Hill, Kent; M.P., 1832-41; began systematic study of Gk. history in 1822; pub. famous *History of Greece*, in 12 vol's, 1846-56; also wrote *Plato and other Companions of Socrates*, *Aristotle*, and some minor works. G. was prominent supporter of Univ. Coll.,

London, and of Univ. of London, becoming vice-chancellor in 1862; buried in Westminster Abbey. His democratic views well fitted him to interpret Athenian history and culture.

GROTEFEND, GEORG FRIEDRICH (1775-1853), Ger. scholar; famed for his successful deciphering of the Babylonian cuneiform writing.

GROTESQUE, extravagant style of ornament containing unnatural forms of animals, the human figure, etc.

GROTIUS, HUGO, HUIG VAN GROOT (1583-1645), Dutch politician and jurist; *b.* Delft; entered profession of law; wrote Latin plays and verses; app. historiographer to United Provinces, 1603; sent to England to make arrangements concerning Greenland whale fisheries, 1613. In the disputes in Holland between rigid Calvinists and the followers of Arminius, G. tried to restrain the Calvinist clergy by maintaining supremacy of State in Church affairs, and composed edict counselling toleration, the publication of which aroused popular resentment. G. was arrested and sentenced to lifelong confinement; but his wife, who shared his imprisonment, soon afterwards contrived his escape; going to Paris, G. later held the post of Swed. ambassador. His most celebrated works are *De Jure Belli et Pacis*, a treatise on jurisprudence, and *Annales et Historiae de Rebus Belgicis*, an historical work.

GROTON, a town of Connecticut, in New London co. It is on the Thames River and on Long Island Sound, and is opposite New London. Here was Fort Griswold which is famous for the massacre of an American garrison by the British, in 1781. Pop. about 2,000.

GROUCHY, EMMANUEL, MARQUIS DE (1766—1847), Fr. soldier; supported Revolution and rose rapidly in republican army; distinguished at *Hohenlinden, Wagram,* and in Russia in 1812; marshal, 1814; defeated Blücher at *Ligny*; exiled from France after *Waterloo,* returning in 1821.

GROUND-NUT, a term often applied to the edible parts of the roots of various plants. Amongst the best known may be mentioned the earth nut (*Bunium esculentum*) and the roots of the *Apios tuberosa.*

GROUND-RENT, in Eng. law, is the rent paid to the owner of the freehold in the ground.

GROUP INSURANCE. See INSURANCE.

GROUPS, THEORY OF, a branch of mathematics dealing with the sets of operations which may be performed on a given set of objects; has wide applications in higher mathematics, notably in the theory of invariants, of algebraic and especially of differential equations, of geometrical transformations, etc.

GROUSE include black g. (*Tetrao tetrix*) and red g. (*Lagopus scoticus*), so named from color of male plumage. They inhabit moorland areas; birds of strong but heavy flight; cock is polygamous, fighting for mates; nest on ground, open, containing from six to ten eggs; males of the two species further distinguished by lyrate curvature of tail-feathers in black g.

GROVE, SIR GEORGE (1820-1900), Brit. publicist; chiefly wrote about Palestine exploration and music; secretary, Crystal Palace, 1852; director, Royal College of Music. *Dictionary of Music* and other works.

GROVE CITY COLLEGE, a co-educational, non-sectarian institution situated at Grove City, Pa. It was founded in 1884. In 1922 there were 431 students and a teaching staff of 25 under the presidency of W. C. Ketler, LL.D.

GROW, GALUSHA AARON (1823-1907), member of Congress; *b.* Windham County, Conn.; *d.* Glenwood, Pa. He practiced law in Susquehanna County, Pa. after graduating from Amherst College in 1844, and six years later was elected to the House of Representatives, serving till 1863, first as a Free-Soil Democrat, then as a Republican. He was Speaker from 1861 to 1863 and effected the passage of the Homestead Law after a ten-years' fight. He was Congressman-at-large from Pennsylvania from 1894 to 1903, when he retired.

GRUB, the larvæ of insects, or more particularly the underground larvæ of Crane Flies or Daddy-long-legs, known as 'the grub'—destructive to corn crops.

GRUB STREET, former name of Milton Street, near Moorfields, London, where in Dr. Johnson's time lived colony of needy hack-writers, penny-a-liners, 'whence any mean product is called G.S.'

GRUMENTUM (40° 20′ N., 16° 30′ E.), ancient town, Lucania, S. Italy, on Aciris.

GRUNDY, MRS., character in Morton's play, *Speed the Plough,* 1800, who does not appear, but whose opinion is much feared by a neighboring farmer's wife; hence the Eng. archetype of puritanical prudery and straight-laced conventionality.

GRUYERE (46° 35′ N., 7° 5′ E.), town, Fribourg, Switzerland; famous cheese.

GRYPHIUS, ANDREAS (1616-64), Ger. poet and dramatist; wrote lyric poetry of considerable merit; the former including *Peter Squenz, Horribilicribrifax*, etc.; the latter, *Carolus Stuardus, Katharina von Georgien*, and others.

GUACHARO, or OIL BIRD (*Steatornis*), a Picarian bird confined to Trinidad and the coastal region of the N.W. of South America; so called on account of the fat contained in the nestlings, which is used for lighting and as a butter-substitute by the natives; a twilight feeder, which nests in caves.

GUADALAJARA (40° 50′ N., 3° W.), province, Spain; generally level; fertile; traversed by Tagus; produce chiefly agricultural; area, 4676 sq. miles. Pop. 210,000. Capital, Guadalajara; has fine old ruined palace; cotton and woolen industries. Pop. 12,000.

GUADALAJARA (21° 9′ N., 103° 2′ W.), town, Mexico; capital of Jalisco State; contains cathedral, univ., art academy, mint; many interesting churches; various charitable institutions; important trade, cotton, woolen, iron, and steel manufactures, leather, pottery. Pop. 120,000.

GUADALQUIVIR (36° 47′ N., 6° 22′ W.), river, Spain; rises in Sierra de Cazorla; flows S.W. for 360 miles, into Atlantic; navigable to Seville; ancient *Baetis*.

GUADELOUPE (16° 12′ N., 61° 40′ W.), island in Lesser Antilles (W. Indies), forming important Fr. colony with five island dependencies; capital, Basse Terre; climate hot, but healthy; soil fertile and well cultivated. Sugar, coffee, and rum are exported. G. was discovered by Columbus; acquired by France, 1634; taken by British, 1794, 1810; restored to France, 1814. Area, 687 sq. miles. Pop. 190,000.

GUADIANA (37° 10′ N., 7° 20′ W.), river, Spain and Portugal; rises in Span. province, Albaceté; flows through Ciudad Real, Badajoz, and Portug. province Alemtejo; separates Huelva from Portug. province Algarve; falls into Atlantic; length, 500 miles; navigable 40 miles above mouth; ancient *Anas*.

GUADIX (37° 19′ N., 3° 8′ W.), town, Granada, Spain. Pop. *c.* 12,000.

GUADUAS (*c.* 5° S., 74° 50′ W.), town, Colombia, S. America, near Magdalena River, 50 miles N.W. of Bogotà. Pop. 10,000.

GUAIACUM, genus of trees, natural order *Zygophylleae*; dark greenish, dense, hard wood heavier than water. The heart wood and resin of *G. officinale* and of *G. jankum* from the W. Indies have an acrid and aromatic taste and a balsamic odor.

GUALEGUAYCHÚ (33° 2′ S., 58° 34′ W.), town, river port, Argentina, S. America, on Rio Gualeguaychú; meat products, hides. Pop. 15,000.

GUAM, the largest of the Ladrone Islands, also known as the Mariana Archipelago, and was occupied by the United States in 1898. Located lat. 13° 26′; long. 44° 43′ E. It is 32 miles long and 4 to 10 miles wide, and the area is about 210 sq. miles. The southern part is hilly; the northern part a coral formed plateau. About 30,000 acres are cultivated. The forests are rich in fine woods and also furnish coconuts, pineapples, bread fruit, and custard apples. The fields produce rice, hemp, tobacco, cacao, coffee, melons, etc. The only native mammals are rats, bats, and flying foxes. Goats were introduced and have largely multiplied, and there are some deer. The island has no snakes and the scorpions and centipedes are harmless. Cows and pigs flourish from the abundant food. There is much rain, but the climate is temperate except in midsummer. Heavy storms are frequent and a typhoon July 6, 1918 ruined crops and deprived most of the inhabitants of their homes. The people call themselves Chomorros, speaking a Malay dialect. The majority are in villages. The chief harbors are Pago and Tarofofo. In 1920 the population was 14,246. Only 69 Americans are residents. Agana is the capital. The island is under the U.S. Navy Dept. as a navy station, the governor being a naval officer appointed by the president. See Map, Asia.

GUAN (*Penelope*), a native of tropical America, is a handsome relative of common poultry bird; of blackish-bronze color, with naked throat furnished with large pendant scarlet wattle.

GUANABACOA (23° 7′ N., 82° 19′ W.), town, sea bathing resort, Cuba, West Indies; residential suburb, 5 miles E. of Havana. Pop. 14,000.

GUANACO, HUANACO, animal included in *Camelidae*; native throughout southern half of S. America; smaller and thicker set than camel, and without, hump.

GUANAJUATO (21° N., 100° 48′ W.); inland state, Mexico; mountainous in N., the southern portion forming part of

a fertile plain; chief river, Rio Grande de Lerma; very rich in minerals, gold, silver, lead, tin, iron; some cattle reared; cotton and woolen manufactures, tanneries. Area, 11,374 sq. miles. Pop. 1,200,000.

GUANAJUATO, SANTA F ÉDE GUANAJUATO (21° N., 100° 48′ W.), city, capital of G. State, Mexico; center of large mining district; manufactures cotton, pottery; founded by Spaniards, 1554. Pop. 36,000.

GUANCHES, GUANCHOS, original inhabitants of the Canary Islands; supposed to have been of Berber stock, of fine physique, and a highly intelligent race; now practically extinct.

GUANO, valuable fertilizing manure, consisting chiefly of the excrement of sea-birds that feed on fish. Deposits to a depth of 60 ft. have been found off the coast of Peru, Bolivia, and Chile. A good substitute has been found in fish g., obtained by grinding to powder the heads and bones of cod and herring. The chief constituents of g. are phosphoric acid and nitrogen (ammonia).

GUANTA (10° 6′ N., 64° 47′ W.), seaport town, Bermudez State, Venezuela, S. America; exports coffee, sugar.

GUANTANAMO, a town in the chief coffee-growing district of Cuba, 13 m. N. of Caimanera, its port, and 49 m. E. of Santiago de Cuba. One of the four naval stations ceded to the United States by Cuba in 1901. Exports sugar and lumber. Pop. 8,500.

GUAPORE, a river of South America, rising in the Brazilian province of Matto Grosso. After a course of about 500 miles it unites with the Mamore and forms the Madeira river.

GUARANIS, S. American Indians inhabiting Paraguay and Uruguay.

GUARANTEE, a promise by one person to be answerable for the debt, default, or miscarriage of another. Originally at common law it need not be in writing, but the Statute of Frauds provided that 'no action shall be brought whereby to charge the defendant upon any special promise to answer for the debt, default, or miscarriages of another person, unless the agreement upon which such action shall be brought or such memorandum or note thereof shall be in writing and signed by the party to be charged therewith, or some other person thereunto lawfully authorized.'

GUARATINGUETA (22° 45′ S., 45° 15′ W.), city, São Paulo, Brazil, S. America, on Parahiba; agricultural center.

GUARD, COAST. See Coast Guard.

GUARD, NATIONAL. See Army, United States.

GUARDAFUI, CAPE (10° 50′ N., 51° 20′ E.), cape, N.E. of Abyssinia, Africa.

GUARDI, FRANCESCO (1712-93), Venetian artist; prolific painter, whose works are similar to those of his master, Canaletto; fine examples in Louvre and Manfrini Palace, Venice.

GUARDIAN, a custodian in law of persons incapable of caring for themselves, and especially persons under 21 years of age. A guardian is entitled to the care and custody of the person in his ward and must give a careful accounting of disbursements and receipts. Trust companies are largely employed in the business of guardianship.

GUÁRICO (8° 30′ N., 67° 30′ W.), state, Venezuela, S. America; Capital, Calabozo. Area, 25,631 sq. miles. Pop. 190,000.

GUARINI, GIOVANNI BATTISTA (1537-1612), Ital. poet; friend of Tasso, whom he succ. as court poet at Ferrara. His masterpiece is *Pastor Fido*, 1590, a pastoral drama, the scene of which is laid in Arcadia. The literary style is highly finished, and the work is invaluable as a picture of contemporary manners and vices.

GUARINO DA VERONA, GUARINUS (1374-1460), Ital. scholar; an important figure in connection with the revival of Gk. learning in Italy; translated and wrote commentaries on Gk. authors.

GUARNIERI, JOSEPH DEL GESU, GUARNERI (1687-1745), principal member of a Cremona family of famous violin-makers.

GUATEMALA. (1) Republic of Central America, bounded by Mexico, Brit. Honduras, Gulf and Republic of Honduras, Salvador, and Pacific Ocean; cap. Guatemala la Nueva. Surface consists of low-lying marshy plains along Pacific coast. N. and W. of these lies the Sierra Madre, the watershed between the Pacific and the Atlantic, with many volcanoes, including Tajamulco, 13,800 ft., Acatenango, 13,615 ft., Fuego, 12,570 ft. Farther N. and E. extend mountainous country and great plain of Peten, mostly Ind. pasture-land. Principal river is Montagua, 250 m.; lakes include Lake of Peten, Gulfo Dulce, Atlitan. There are vast forest lands; copious rainfall on Atlantic slope.

Guatemala was taken by Spaniards, 1524; independence declared, 1821, and Guatemala joined Confederation of Central America; present republic estab-

lished, 1847; San Salvador defeated, 1863; Carrera dictator, 1845-65; constant strife with neighboring states led to Central America; present republic established, 1847; San Salvador defeated, 1863; Carrera dictator, 1845-65; constant strife with neighboring states led to Central American Arbitration Treaty, 1907. In World War Guatemala was the first Central American republic to sever diplomatic relations with Germany, 1917.

The most important crop is coffee; rubber, tobacco, sugar, wheat, fruit, and medicinal plants are also produced; gold, silver, lead, and copper mines are worked; timber is extensively exported. Prevailing religion is R.C. Majority of the inhabitants are Indians; many half-castes, few Europeans. Area, 48,290 sq. m.; pop. 2,000,000. See Map, Central America.

GUATEMALA LA NUEVA, cap. of above, Central America, (14° 36′ N., 90° 30′ W.); on plain *c.* 5,000 ft. above sea-level, and 70 m. from its port, San José, on Pacific. Among chief buildings are cathedral, government house, mint; numerous educational institutions, churches, hospitals; woolen and cotton industries. Pop. 90,000.

GUATEMALA ANTIGUA, or *Old Guatemala* (14° 27′ N., 90° 37′ W.), the original city, founded 1527, was destroyed by flood, 1541, and by earthquake, 1773; the third capital was then removed to present site, about 15 m. N.E. Pop. 7,000.

GUAVA, tropical American shrub (*Psidium Guayaba*) and its fruit, much used for jelly and preserves; family *Myrtaceae.*

GUAYAMA (18° N., 66° 5′ W.), town, Porto Rico, W. Indies; exports sugar, rum, coffee. Pop. 9,000.

GUAYAQUIL (2° 10′ S., 79° 58′ W.), city, chief port, Ecuador, S. America; built mainly of wood. Among principal structures are government buildings, town hall, cathedral, bp.'s palace, univ. G. exports cacao, coffee, rubber; has shipyards and various manufactures. The city was formerly regarded as the most unhealthy in the world, on account of the prevalence of yellow fever. Gen. W. C. Gorgas, acting for the Rockefeller Foundation, cleared the city of this plague in 1919. Pop. 60,000.

GUAYAS (2° 30′ S., 80° W.), maritime province, Ecuador; S. America; most important, industrially and commercially, of the republic; climate hot, humid, unhealthy; soil fertile; agriculture is chief pursuit; principal products—cacao, coffee, tobacco, sugar-cane; capital, Guayaquil. Area, 8300 sq. miles. Pop. *c.* 100,000.

GUAYMAS (28° 10′ N., 110° 50′ W.); seaport, Mexico, on Gulf of California; good harbor; exports metals, hides. Pop. 9,000.

GUBBIO (43° 22′ N., 12° 34′ E.), city (ancient *Iguvium*, or *Eugubium*), Perugia, Italy, at foot of Monte Calvo; has a cathedral (XIII. cent.) and ducal palace (XIV. cent.); the famous Eugubine Tablets, discovered in the neighborhood in 1446, are preserved in the museum; manufactures, majolica. Pop. 27,000.

GUBEN (51° 58′ N., 14° 42′ E.), town, Brandenburg, Prussia, on Neisse; woolen cloth, yarn. Pop. 40,000.

GUDGEON, small freshwater fish, genus *Gobio*, of carp family.

GUDRUN, legendary *dau.* of King Hettel, betrothed to King Herwig of Heligoland, but carried off by Hartmuth, king of Norway; famed for heroic fortitude and resignation.

GUELPH (43° 30′ N., 80° 21′ W.); city, river port, Ontario, Canada; seat of Ontario Agric. Coll.; flour mills, woolen mills. Pop. 12,000.

GUELPHS AND GHIBELLINES, names of great conflicting parties into which Germany and Italy were divided in later Middle Ages, XII.-XV. cent.; names Italianized from German *Welf* and *Waiblingen*, warcries of Saxony and Empire respectively; Ghibellines were aristocratic party, supporting the emperor; Guelphs (or Guelfs) were democratic party, favoring the pope. House of Brunswick and Hanover are Guelphs by descent, whence British throne has been held by a Guelph since George I. In 1914 the name of 'Windsor' was substituted for 'Guelph' as the family. name of the royal house of England.

GUERBER, HELENE ADELINE, an author. She was educated abroad. In addition to writing many books she was also the editor of French and German textbooks. Among her works are: *Myths of Greece and Rome*; *Myths of Northern Lands*; *Legends of the Virgin and Christ*; *Stories of the Wagner Operas*; *Story of the Chosen People*; *Story of the Greeks*; *Story of the Romans*; *Story of the English*; *Story of the Thirteen Colonies*; *Story of the Great Republic*; *Stories of Shakespeare's Comedies*; *Stories of Shakespeare's Tragedies*; *Stories of Shakespeare's English History Plays*; *The Book of Epic*; *Joan of Arc*, *French Composition.*

GUÉRIN, JEAN BATISTE PAULIN (1783-1855), Fr. artist; famed for portraits; works include *The Dead Christ, Cain and Abel, Anchises and Venus.*

GUERIN, JULES (1866), an American artist, *b.* at St. Louis, *s.* of Richmond L. and Louise Davis Guerin. He studied art under Benjamin Constant and Jean Paul Laurens. He was the director of color and decoration at the Panama P.I. Exposition and painted the decorations for the Lincoln Memorial Building, Washington and also for the Pennsylvania Station, New York City. In addition to the Yerkes Medal, he was awarded a silver medal, at the St. Louis Exposition in 1904 and a gold medal at the Panama P.I. Exposition in 1915.

GUÉRIN, MAURICE DE (1810-39), Fr. author; distinguished both as poet and prose writer; prose is marked by masterly style; shows remarkable sympathy with nature. His sister, Eugénie, 1805-48, whose *Journal* and *Letters* are highly valued, was intimately associated with his work.

GUERNSEY (49° 27′ N., 2° 35′ W.), second largest of the Channel Islands, 30 miles W. of Normandy; surface undulating, sloping gradually N. to S.; climate mild; popular health resort; produces large quantities of fruit, flowers, and vegetables; famous breed of cattle; some granite quarried, and fishing carried on. Capital, St. Peter Port; good harbor; residence of lieut.-gov. Area, 25 sq. miles. Pop. 1921, 40,120.

GUERNSEY LILY, or *Nerine Sarniensis*, a Cape plant belonging to the order Amaryllidaceæ. The flowers are of a delicate pink color.

GUERRERO (17° 40′ N., 101° W.), Pacific state, Mexico; mountainous; rich in minerals; fertile; produces coffee, cereals, tobacco; capital, Chilpancingo; chief port, Acapulco. Area, 25,000 sq. miles. Pop. 610,000.

GUERRILLAS, name given to bands of armed men who carry on an irregular warfare on their own account. They belong peculiarly to Spain, and in 1808-14 they fought against the French. Some joined Wellington and rendered him service, but when peace was concluded formed themselves into robber bands. The term Guerrilla Warfare is used to denote war carried on by bands in an unorganized manner. In the Basque provinces at the time of the civil wars of Spain, G. W. was frequent. The subject was dealt with at the Hague Conference in 1899, and the rules made were reaffirmed in 1907.

GUEUX, LES ('the Beggars'), name given to the Netherlanders who, in the XVI. cent., revolted against the oppression of Philip II. The 'Beggars of the Sea' harassed the Span. navy.

GUGLIELMI, PIETRO (1727-1804), an Italian musical composer, *b.* at Massa Carrara. He studied under Durante, and produced his first operatic work at Turin in 1755. In 1762 he went to Dresden to conduct the opera there, and some years afterwards appeared in London. In 1793 he became musical director at the Vatican. He was a writer of operas, both comic and serious, as well as of oratorios and orchestral pieces. His best operas are *La Didone*; *Enea e Lavinia*; *I due Gemelli*; *La Pastorella Nobile*; *La Bella Pescatrice.*

GUIANA, part of S. America (1°-8° 30′ N., 51° 30′-61° 30′ W.), between Orinoco and Amazon rivers, embracing Venezuelan, Brit., Dutch, Fr., and Brazilian Guianas. Physical geography is much the same in all three colonies. Along the coast are flat, swampy tracts, with rich, fertile soil; beyond this, the land rises to undulating savannas, behind which are mountainous regions covered with almost impenetrable forest. Guiana contains innumerable rivers, which form chief means of communication; almost all larger streams are connected by creeks and channels, and are navigable up to rapids and falls. Vegetation is remarkably rich and luxuriant; sugar, coffee, rice, cocoa, fruits cultivated; forests yield fine timbers, balata, rubber, oil, balsams, gums, tonka beans, nuts, etc. Birds are particularly brilliant in plumage, and include humming-birds, parrots, macaws, and orioles; tiger-cats, jaguars, tapirs, peccaries, manatees, capybaras, alligators, and great variety of insects to be found. Gold and diamonds are produced. Inhabitants are chiefly Europeans, Indians, and negroes. Climate not unhealthy though tropical; earthquakes and hurricanes practically unknown.

British Guiana, largest of three colonies, is bounded on W. by Venezuela, S. by Brazil, and E. by Dutch Guiana. Chief towns are Georgetown, cap., on mouth of Demerara R., and New Amsterdam, on Berbice R.; in W. are Pacaraima Mts., culminating in Roraima, on Venezuelan boundary; principal rivers are Essequibo, Corentyn, Berbice, Demerara, Mazuruni, and Cuyuni; railways connect Georgetown with New Amsterdam, Demerara with Essequibo, and a line runs from Demerara a few miles along W. coast. Among principal exports are sugar, rum, rice, molasses, coffee, balata, timber, shingles, and gold. New goldfield discovered on S. frontier in 1914; promising

diamond fields; iron ore and manganese. Administration is under governor, assisted by elected legislative council. Area, 89,480 sq. m.; pop. 296,000.

Dutch Guiana, or *Surinam*, bounded on W. by Brit. Guiana, S. by Brazil, and E. by Fr. Guiana; cap., Paramaribo, near mouth of Surinam R.; contains great extent of dense forest and unexplored country; well watered. Exports embrace sugar, rum, balata, timber, and gold. Area, 46,060 sq. m.; pop. 92,200, exclusve of negroes of forests.

French Guiana, or *Cayenne*, bounded on W. by Dutch Guiana, S. by Tumac Humac Mts., and E. by Brazil. Cayenne, cap. and chief center of population. Fr. Guiana is penal settlement and the least prosperous of three colonies: little agricultural industry; gold-mining principal occupation. Area, 32,000 sq. m.; pop. 49,000.

Guiana was sighted by Columbus in 1498; later visited by adventurers in search of El Dorado; in 1595 and 1617 explored by Raleigh; first settlements made by Dutch in Demerara and Essequibo (*c.* 1613); English settled in Surinam and French in Cayenne; in 1616 English seized Dutch and Fr. Guiana, but restored them (1617), and handed over Surinam to Netherlands in exchange for New York. By 1674 Dutch claimed all territory now known as Dutch and Brit. Guiana; after prolonged struggle British captured Berbice, Demerara, and Essequibo, and in 1831 formed colony of Brit. Guiana. Venezuelan and Brit. Guiana boundaries fixed in 1899. Fr. and Brazilian boundary dispute settled in 1900. Brit. and Brazilian frontier question settled by award of King of Italy in 1904. See Map, South America.

GUIART, GUILLAUME (fl. 1300), Fr. poet-chronicler; his *Branche des royaulx lignages*, dealing with the history of the Fr. kings, is valuable for the later period.

GUIBERT OF NOGENT (1053-1124), Fr. historian; wrote *Gesta Dei per Francos*, an account of the First Crusade.

GUICCIARDINI, FRANCESCO (1483-1540), Ital. politician and historian; *b.* Florence; ambassador to Span. court, 1512; became papal ruler of Reggio and Modena, 1515; of Parma, 1521; of Romagna, 1523; of Bologna, 1531; supported the Medici at Florence, and successfully defended Duke Alexander from charges leveled against him at imperial court in 1535. Alexander's successor, Cosimo, dismissed G., who withdrew from public life. He wrote *Storia d'Italia* and other hist. and political works; *Storia d'Italia* is a masterly analysis of Ital. history between 1494 and 1532.

GUICHARD, KARL GOTTLIEB (1724-75), military historian and Prussian officer; of Fr. descent; fought for Prussia in Seven Years War, 1757-62;

GUIDO OF AREZZO, GUIDO ARETINUS (*c.* 995-1050), Fr. Benedictine monk and musician; birthplace uncertain; invented 'Harmonic' or 'Guidonian Hand' and was first to use stave with lines and spaces.

GUIDO RENI (1575-1642), Ital. artist principal master of the Bolognese school; *b.* Bologna; studied first under Calvaert, and later under Caracci. Removing to Rome, he obtained the patronage of Pope Paul V. His best work in Rome is considered to be *Aurora and the Hours* (on the ceiling of the Rospigliosi Palace).

GUIENNE, GUYENNE (45° N., 1° E.), ancient province, S.W. France; now divided into departments of Gironde, Dordogne, Lot, Aveyron, Lot-et-Garonne, and Tarn-et-Garonne. G. belonged to England (1154) after marriage of Eleanor of Aquitaine to Henry II.; long disputed by English and French; annexed by French, 1453.

GUILDFORD (51° 14′ N., 0° 34′ W.), market town, Surrey, England, on Wey; remains of ancient Norman castle; noted grain and live-stock markets; flour-mills. Pop. 1921, 24,927.

GUILDHALL, hall of London municipality; erected, 1411; destroyed, 1666; re-erected, 1669; restored, 1789; important library and art gallery.

GUILDS, GILDS, mediæval associations formed for the protection and development either of commerce or some particular trade. The earliest were of a semi-religious character, providing, amongst other things, for the payment for masses for souls of the departed, and some of them so remained until their suppression by Henry VIII. in 1547. The industrial g., however, was classed under two distinct heads—the 'gild merchant' (merchant g's), an organization which came into existence in England soon after the Norman Conquest, and the 'trade' or 'craft' g., which first began to flourish during the XIV. cent. On the Continent the g. was of earlier origin. Members of the merchant g. enjoyed the privilege of regulating the trade of a borough. Their influence was very great, especially in freeing industrial cities and ports from the power of feudal lords. The trade g. was an association of craftsmen in the different branches of industry, to protect

the common interests of the members. A subsequent development of the trade g's were the various *livery companies*, each of which followed its particular craft or 'mystery.' The word 'guild' is now generally used in connection with social or religious improvements societies, such as temperance g's, communicant's g's, etc.

GUILLEMOT AND AUK FAMILY (*Alcidae*), a family of marine swimming birds confined to the colder regions of the northern hemisphere, characterized by short wings, heavy body, and fully webbed anterior toes, the first toe being absent. The most interesting and largest member of the family was the flightless Great Auk or Garefowl (*Alca impennis*), distinguished by its large, deep beak, equalling the head in length, black plumage on the upper surface and white on the under, as well as on a patch above the eyes. Confined to the North Atlantic, its chief breeding-places were rocky islands off Iceland and Newfoundland, where incessant slaughter for more than two centuries brought about its extinction in 1844. Its remains have been found in Orkney.

GUILLOTINE, machine used in France for decapitating criminals. Its chief feature, a heavy blade, with sharp oblique lower edge, can be made to fall by its own weight between two grooved upright posts, on to the neck of the victim fastened below; derives its present name from its reputed inventor, Dr. Guillotin (1792), but similar instruments had been in use before the Fr. Revolution.

GUIMARAES (41° 28′ N., 8° 11′ W.), fortified town, Portugal; cutlery, paper, leather; noted sulphur springs in vicinity. Pop. 10,000.

GUINEA, dist. of W. Africa, stretching along the shores of Gulf of Guinea, between Senegal and Cape Negro (7° N., 2° W.), divided into Upper Guinea (E. and W.) and Lower Guinea (N. and S.). Guinea includes coast regions of Sierra Leone, Gold Coast, Lagos, Nigeria (Brit.); Fr. Guinea, Ivory Coast, Dahomey, Fr. Equatorial Africa; Togo, Kamerun, Port. Guinea and Angola (Port.); Span. Guinea; Belgian Congo; Liberian Republic; also Guinea Islands—Fernando Po, Annabon (Span.), Principe, São Thomé (Port.). See Map, Africa.

GUINEA, Eng. gold coin, in circulation 1663-1817; so named because the gold of which it was first made came from the Guinea Coast; at first issue was worth 20s., in 1694 was 30s., by 1717 had become as now 21s.

GUINEA-FOWL (*Numida*), genus of Pheasants; Common G., or Pintado (*N. meleagris*) of W. Africa, is domesticated in Britain; head is naked, plumage is speckled with white. G's in wild state are gregarious.

GUINEA-PIG, or **CAVY (CAVIA),** a genus of small rodents native to S. America, but now domesticated in most countries. Sometimes considered as a separate species (*Cavia cobaya*), the familiar common cavy is probably a domesticated form of the *Cavia aperea* of Guiana and Brazil, introduced by the Dutch into Europe in the 16th century. The domesticated kinds are mostly white, or marked with yellow and black, or tawny-colored. They have short limbs, the fore-feet having four toes, the hind feet only three. Their ears are short and rounded, and they have no tails. Gs. are very prolific, producing young five or six times a year. They are much used in bacteriological laboratories for the study of germ-diseases.

GUINEA-WORM (*Filaria medinensis*), a parasite of man common in tropical districts, particularly on the Guinea Coast, its habitat being the subcutaneous tissues of the back and legs, where it forms swellings which develop into abscesses.

GUINES (22° 50′ N., 82° W.), town, Cuba, W. Indies; sugar-cane, tobacco. Pop. 8000.

GUINEY, LOUISE IMOGEN (1863-1923), poet; *b.* Boston, Mass. She graduated from Elmhurst Academy, Providence, and also studied under private tutors. Besides poetry she wrote considerable prose, and edited the works of Mangan and Matthew Arnold. Her writings date from 1884 and were largely produced in England, where she became permanently domiciled.

GUINOBATAN (12° 50′ N., 123° 43′ E.), town, Luzon, Philippine Islands; hemp. Pop. 21,000.

GUIPUZCOA (43° 6′ N., 2° 10′ W.), maritime province, N. Spain; surface mountainous; fruit, timber, cattle; rich in minerals (iron, lignite, copper); flourishing industries; good fisheries; climate mild, healthy; many mineral springs; capital, San Sebastian. Area, 728 sq. miles. Pop. 230,000.

GUISCARD, ROBERT (1015-85), Norman conqueror of Sicily; Count of Apulia, 1057; reduced Sicily, 1061-72; conquered Bari, 1071; drove Henry IV. from Rome and restored pope, 1083-84.

GUISE, DUKEDOM OF held by younger branch of family of Lorraine, founded by Claude of Lorraine, 1st

Duke of G., who served with distinction in Italy under Francis I., and later in Luxembourg, 1542; his *dau.* Mary m. James V. of Scotland, and his two eldest *sons* attained great importance. Francis, 2nd duke, elder *s.* of Claude, acquired great military reputation by his defense of Metz against Charles V., 1552, and his conquest of Calais, 1558; he subsequently captured Guines and Arlon, and in 1562 defeated the Huguenots at *Dreux*; was for many years the most powerful personage in France; assassinated in 1563. His *bro.* Charles entered the Church, and became cardinal of Lorraine; he was prominent minister of Henry II., and introduced Inquisition in France. Henry, 3rd duke (1550-88), is chiefly noted for his opposition to Huguenots, whom he defeated at *Jarnac* and *Moncontour*, 1568, and against whom he formed Catholic League, 1584; he also had considerable share in instigating the massacre of St. Bartholomew's Eve in 1572, and opposed Henry of Navarre; he was assassinated in 1588. Henry, 5th duke, failed to secure crown of Naples, 1647, 1654. Title became extinct with death of Mary, Duchess of G., in 1688.

GUITAR, a stringed instrument of Oriental origin somewhat similar to the lute; popular in Spain and Italy. G. has a flat back with curved sides, large sound-hole, and six strings—the three highest of gut, the three lowest of silk, spun over with silver wire; sound is produced by plucking the strings with the fingers of right hand, while the left hand is used for altering the pitch by pressing a fretted finger-board; music is written in treble clef, but sounds an octave lower than written.

GUITEAU, CHARLES JULIUS (1840-1882), slayer of President Garfield. He was a Chicago lawyer who had vainly applied to the President for the post of American consul at Marseilles, and was also believed to have become hostile to Garfield through being influenced by the latter's stalwart opponents, led by Roscoe Conkling. He shot Garfield on July 2, 1881, in the waiting room of the B. & O. railway station in Washington, D. C. The President succumbed to his wound on Sept. 19. Guiteau was tried and convicted for murder, the defense pleading insanity, and was hung in the District of Columbia jail on June 30, 1882.

GUITERMAN, ARTHUR (1871), an American author; *b.* at Vienna, Austria, *s.* of Alexander and Louise Wolf Guiterman, Americans. He graduated from the College of the City of New York in 1891 and from then until 1906 was engaged in editorial work on the Woman's Home Companion, the Literary Digest and other magazines. He was a lecturer on magazine and newspaper verse at the New York University School of Journalism from 1912-15, contributed *Rhymed Reviews* to Life, and ballad and lyric verse to various other magazines and was the author of *The Mirthful Lyre*, 1918; *Ballads of Old New York*, also *Chips of Jade*, 1920 and *A Ballad Makers Pack*, 1921 and others.

GUITRY, LUCIEN (1860), Fr. actor, made début as Armand in *La Dame aux Camelias* (1878), and has appeared successfully in many roles, including creation of part of *Chantecler* in Rostand's play (1910).

GUITRY, SACHA (1885), Fr. dramatist and actor, *s.* of Lucien Guitry; a dramatist of great versatility, displaying genius for light comedy in such plays as *La Pelerine Ecossaise*, and for serious and moving scenes-(*e.g.*), *Pasteur*. His *Le Mari, la Femme, et l'Amant* was one of the successes of Fr. stage in 1919. In May and June 1920 there was a Guitry season at Aldwych Theater, London, when *Nono, La Prise de Bergop-Zoom, Pasteur, Jean de la Fontaine, L'Illusioniste*, and *Mon Pere avait Raison* were well staged, the chief parts being taken by the author, his wife (Mlle. Yvonne Printemps), and his father. Other works include *Le Kurtz, Les Nuees d'Aristophane, Petite Hollande*. Several of his plays were produced in the United States in 1922 and 1923.

GUIZOT, FRANÇOIS PIERRE GUILLAUME (1787-1874), Fr. politician and author; *b.* at Nîmes, of Huguenot stock; ed. at Geneva and Paris; early turned his attention to literature; appointed prof. of Modern History at Sorbonne, 1812, in which year he m. Pauline de Meulan, writer on educational subjects. In 1814 he was app. Sec. Gen. of Interior under Louis XVIII., but retired from office after Napoleon's escape from Elba in 1815. After final defeat of Napoleon, G. obtained office under Ministry of Justice; was conspicuous member of *Doctrinaire* party; dismissed from office, 1821, he devoted himself to historical research; entered Lower House in 1830; as Minister of Education, 1832-36, he had principal share in development of modern system of education in France. Ambassador to Britain, 1840, but was presently recalled to France to form cabinet; became Foreign Minister, and in 1847 succ. Soult as Premier. His attempts to foster friendly relations with Great Britain were at first crowned with success; but in 1846 the *entente* was

broken by the discovery of the Span. marriage intrigues, which discredited both G. and the king. G. remained in office till Revolution of 1848, when with difficulty he escaped to England. G. wrote *Histoire de la Revolution d'Angleterre depuis Charles I. a Charles II.*, an important hist. work; also author of *Histoire de la Civilisation en France, Histoire de la Civilisation en Europe*, a biography of Washington, and other works.

GUJARAT, GUZERAT (22° N., 72° E.), region, Bombay Presidency, India; includes the N. districts of the presidency, the Gaekwar's territories, and numerous native states.

GUJRANWALA (32°10′N., 74°14′E.), district, Lahore, Punjab, India; chief river, Chenab; manufactures brassware; area, 3198 sq. miles. Pop. 900,000. Capital, Gujranwala. Pop. 27,000.

GUJRAT (32° 47′ N., 74° 9′ E.), chief town, Gujrat district, Punjab, India; cotton goods; brassware; scene of defeat of Sikhs by Brit. under Gough, 1849. Pop. 20,000. District area, 2051 sq. miles. Pop. 751,000.

GULBARGA (17° 19′ N., 76° 54′ E.), town, Hyderabad State, India. Pop. 28,000.

GULFPORT, a city of Mississippi, in Harrison co., of which it is the county seat. It is on the Louisville and Nashville, and the Gulf and Ship Island railroads, and on Mississippi Sound. There is an excellent harbor and the city is an important port of entry. It has a large trade in lumber, naval stores, cotton, etc. Its industries include fertilizer works, canning factories, and sawmills. There is a United States custom house and a post-office building. Pop. 1920, 8,157.

GULF STREAM, a warm, slow-moving oceanic current, from 40 to 100 miles wide, and over 300 fathoms deep, issuing from Gulf of Mexico; flows N.E. along E. coast of N. America to near Newfoundland, where, turning E., it merges into a drift current; causes mildness of Brit. and Norwegian climate.

GULL FAMILY (*Laridae*), a family of about 115 species of strong-flying and swimming birds with completely or partially webbed feet. They are mostly marine, and live upon fishes and crustacea, but some have taken to an inland life, breeding in marshy places and feeding on worms and insect grubs. They are found on all the oceans. Amongst them are the Terns or Sea Swallows (*Sterna*), so called because of their forked tails—active graceful birds which lay their eggs in depressions on sandy shores; with them are reckoned the tropical Noddies (*Anous*). The Skimmers or Scissor-Bills (*Rhynchops*), with long, scissor-like beak, the lower mandible of which protrudes far beyond the upper, occur in Africa, S.E. Asia, and America. Lastly, the Gulls and Kittiwakes may be distinguished by possessing completely webbed feet, a beak shorter than the head, with the upper mandible shorter than the lower, and forming a slight hook at its tip.

GULLET. See LARYNX.

GULLY, WILLIAM COURT, 1ST VISCOUNT SELBY (1835-1909), Brit. politician; Conserv. M.P., Carlisle, 1886; Speaker, House of Commons (1895-1905); peerage and pension (1905); member, Hague Arbitration Court (1907)

GUM ($C_6H_{10}O_5$) is an amorphous *carbohydrate*, the watery solution of which is a jelly with adhesive properties. Gums are exudatious from the stems of plants. *Tragacanth*, from *Astragalus gummifer*, yields two gums, *Tragacanthin* and *Arabin*. The oak and beech give *Xylan*, which on hydrolysis yields the sugar *Xylose*. The gum from *Acacia Senegal* is *Arabin*, used to suspend insoluble oils, powders, etc.

GUM, BRITISH. See DEXTRIN.

GUMBINNEN (54° 35′ N., 22° 9′ E.), town, on Pissa, E. Prussia, Germany; textiles, iron foundries. Pop. 15,000.

GUMBO, or **OKRA,** an annual African herb, natural order *Malvaceae*, with edible fruit.

GUMTI (25° 33′ N.; 83° 20′ E.), river, India; joins Ganges, 17 miles N.E. of Benares, after S.E. course of 500 miles.

GUNBOAT. See NAVY.

GUN-COTTON, explosive substance, is approximately $C_{12}H_{14}(NO_3)_6O_4$, *cellulose hexa-nitrate*, the washed and dried product obtained by soaking cotton-wool in a mixture of three parts of concentrated *sulphuric acid* and one part of *nitric acid* (Sp. Gr., 1.5) for twenty-four hours. It is insoluble in a mixture of alcohol and ether. When lighted, it burns quietly and quickly without smoke. When fused with a detonator it explodes with violence. Gun-cotton forms two non-explosive compounds, *colloidon* and *celluloid*. See EXPLOSIVES.

GUNNERY, or **BALLISTICS,** is that portion of artillery science which deals with the flight of projectiles, and the means whereby accurate shooting from

a firearm can be attained. 'Interior ballistics' is the study of the pressure in the bore of a gun caused by the gases of the explosive which give initial velocity to the projectile. 'Exterior ballistics' is the theory of the flight of a missile traveling at high velocity, and acted on by the force of gravity and the resistance of the air. For comparatively slow motions, the retardation caused by the air varies with the square of the velocity; but with the ogival rotating projectile of a modern gun, so many other considerations come into play that the conditions of flight are mainly determined by experiment. A missile is now fired through equidistant electric screens, and the time of flight between their severed wires noted by a chronograph. By formulæ used in conjunction with experimental ballistic tables, the trajectory or path of any shot at a given velocity can be demonstrated. When once the ranges (corrected for wind, temp., muzzle velocity, etc.) are found, the sights of the gun or the rifle are adjusted for each distance, and their manipulation becomes a matter of mere drill.

GUNNISON, a riv. of Colorado. Its source is in the N. of Saguache co., and its course is W. and N.W., until it enters the Grand R. at Grand Junction, about 25 m. E. of the western borders of Colorado. There are numerous cañons.

GUNPOWDER, an *explosive* obtained by mixing *saltpetre, charcoal,* and *sulphur* together. Its discovery is attributed by some to Schwartz, a Ger. monk, and by others to Roger Bacon. It was known as an explosive, and used as a scientific amusement long before its propelling powers were known. It was probably first employed as a *propellan* by Edward III., since he possessed cannon. The chief combustible is charcoal, which is made from *dogwood, willow,* or *alder.* The charcoal must be free from grit and burn easily, leaving little ash. When made, the charcoal is ground, sifted, and carefully stored. The sulphur, after purification by distillation and melting, is cast in moulds and then ground and sifted. *Potassium nitrate* forms a very suitable source of oxygen as it does not become deliquescent. Each constituent is weighed carefully and passed through a sieve of known mesh. After moistening, the materials are *incorporated* or moved, twisted, and turned in every direction by iron rollers working on a circular bed. The whole apparatus can be douched with water if friction causes ignition. The product is '*mill-cake.*' The *mill-cake* is pressed and becomes *press-cake.* The higher the density the slower is the initial rate of burning. Excess of moisture reduces the explosiveness. The *press-cake* is broken up and granulated, the grains being afterwards separated and sorted by sieving. Final processes give different shapes (number of faces) to the grains to suit various requirements. The products of combustion should be *nitrogen* and *carbon dioxide* as gases, and *potassium sulphate* and *carbonate* as solids.

GUNPOWDER PLOT, conspiracy of Eng. Rom. Catholics (on account of James I.'s refusal to redress their grievances) to blow up with gunpowder the Houses of Parliament when the king and his ministers were there on Nov. 5, 1605. Originator of plot was Robert Catesby, the other conspirators including Thomas Percy, Sir Everard Digby, Francis Tresham, and Guy Fawkes. Barrels of gunpowder were secretly lodged in coal cellar underneath House of Lords, and it was arranged that Fawkes should fire it at the appointed time. On Oct. 26 an anonymous letter, generally attributed to Tresham, was received by Lord Mounteagle; this aroused suspicion and led to discovery of plot; cellars were searched on Nov. 4, and Fawkes was arrested; other conspirators took to flight, but were presently overtaken when some, including Catesby, were killed and others taken prisoner. Fawkes and others were executed, and Tresham died in captivity.

GUNTER, ARCHIBALD CLAVERING (1847-1907), novelist and playwright; *b.* Liverpool, Eng.; *d.* New York. His parents emigrated to California when he was quite young, and there he became a mining engineer and afterwards a stockbroker in San Francisco. Literature attracted him and he ventured to New York City to live by his pen. *Mr. Barnes of New York,* his most successful novel, by which his name is best known, was published in 1887 after being rejected by almost every American publisher. *Mr. Potter of Texas* followed and met with a like success. Succeeding novels resembled them in their fertility of situated and rapid movement. His most popular works were dramatized.

GUNTER, EDMUND (1581-1626), Eng. mathematician; ed. Oxford; became prof. of Astronomy, Gresham Coll., London, 1619; invented the *chain* for land measurement, also *Gunter's scale,* for working navigation problems.

GUNTRAM (561-592), king of Burgundy; *s.* of Clotaire I., and inheritor, with his bro's, of the Frankish dominions; possessed some administrative ability, but few social virtues.

GUNTUR (16° 18′ N., 80° 29′ E.), town, Madras, India; trade in cotton and grain. Pop. 23,000.

GUPTA, Ind. dynasty, *c.* 320-480 A.D., founded by Chandragupta Maurya under Samudragupta, dominions comprised nearly whole of India; succumbed to Bengal.

GURDASPUR (32° 3′ N., 75° 27′ E.), district, Lahore, Punjab, India; area, 1889 sq. miles. Pop. 950,000. Chief town, Gurdaspur. Pop. 6000.

GURGAON (28° 37′ N., 77° 4′ E.), district, Delhi, Punjab, India; chief town, Gurgaon; trade in grain. Area, 1984 sq. miles. Pop. 750,000.

GURKHAS, or **GOORKHAS,** the principal race in Nepal (India). They are a sturdily built people, excellent soldiers; rendered valuable service in suppression of the Indian Mutiny.

GURNEY, EDMUND (1847-88), Eng. philosopher and scientist; ed. at Cambridge, studying classics and medicine but best known for his pioneer work on pyschical research; with Myers and Podmore edit. *Phantasms of the Living*; an acute, scientific thinker.

GURNEY, JOHN (1750-1809), Eng. banker; of a Norwich Quaker family; *f.* of Elizabeth Fry; his *s.* Samuel G., (1786-1856), largely extended the banking business, and was a noted philanthropist.

GUSTAVUS I., VASA (1496-1560), king of Sweden; *b.* at Lindholm, Upland; fought against Danes, 1517-18. His *f.* and other leaders of Swed. party were executed by Christian II. of Denmark, 1520; G. raised an army, and after various battles expelled Danes from Sweden; crowned king of Sweden, 1523. G. established Lutheran religion; excluded bp's from Senate; formed alliance with Denmark; put down peasant insurrection; Diet declared crown hereditary in his house, 1560.

GUSTAVUS II., ADOLPHUS (1594-1632), king of Sweden, hero of Thirty Years War; succeeded, 1611; warred against Denmark, 1611-13, Russia, 1614-17, and Poland, 1617-29; from Russia he acquired Karelia and Ingria, from Poland, Livonia, Courland, Esthonia. He landed in Germany with 13,000 troops in 1630; captured Stettin; failed to relieve Magdeburg, but inflicted severe defeat on Tilly at Breitenfeld, 1631; he attacked and defeated Wallenstein at Lützen, 1632, but was himself slain during the action.

GUSTAVUS III. (1746-92), king of Sweden; succ. in 1771. G. warred against Catharine II. of Russia, 1788-90, and at the naval engagement of Svensksund inflicted a crushing defeat upon the Russians; concluded peace by Treaty of Värälä in 1790; assassinated, 1792.

GUSTAVUS IV. (1778-1837), king of Sweden; succ. 1792; deposed as insane, 1809.

GUSTAVUS V. (1858), King of Sweden; succeeded father, Oscar II. (1907); fifth sovereign of the house of Ponte Corvo and the great-grandson of Marshal Bernadotte.

GÜSTROW (53° 48′ N., 12° 11′ E.), town, on Nebel, Mecklenburg-Schwerin, Germany; has cathedral and ancient ducal castle; ironworks; active trade. Pop. 20,000.

GUTENBERG, JOHANNES (*c.* 1398-1468), Ger. printer; *b.* Mainz; followed various mechanical employments until 1450, when he entered into partnership with Johannes Fust (or Faust), a goldsmith, who furnished the capital to start a printing business. G. is credited with the invention of printing by movable blocks. The partnership was subsequently dissolved, Fust taking an action at law for the recovery of money advanced. G. afterwards started a rival press.

GUTHRIE, a city of Oklahoma, in Logan co., of which it is the county seat. It is on the Atchison, Topeka and Sante Fe Railroad, and on Cottonwood River. Until 1911 it was the capital of the State. It is the seat of St. Joseph's Academy and has a high school and several private schools. Its industries include planing mills and furniture and carriage factories. Pop. 1920, 11,757.

GUTHRIE, THOMAS (1803-73), Scot preacher and philanthropist; wrote three *Pleas for Ragged Schools*; promoted establishment of Industrial Schools for destitute children.

GUTTA-PERCHA is the evaporated milky *latex* of the trees *Dichopsis gutta* and *Dichopsis oblongifolia*, Natural Order *Sapotaceae*. The trees, which are native to the Malay Peninsula, are felled, cut by a special method and the latex collected. Mature trees are the best. When felled during the wet season about 30 oz. per tree are obtained. After evaporation g.-p. is sent to the market as blocks of a dirty greyish appearance often with a reddish tinge. Chemically it consists of a *hydrocarbon* and two *oxygenated resins*.

GUTTENBERG, a town of New Jersey, in Hudson co. It is on the Hudson River. Its chief industry is the

quarrying of stone. It has several industrial establishments. Pop. 1920, 6,726.

GUY OF WARWICK, hero of a XIII.-cent. Eng. metrical romance, who traversed the world performing knightly deeds of valor to win the hand of Felice, *dau.* of the Earl of Warwick.

GUY, THOMAS (1644-1724), Eng. philanthropist; founded Guy's Hospital (1721), and subscribed to other charities.

GUYNEMER, GEORGES (1894-1917), French aviator; *b.* Paris; *d* Poelcapelle, Belgium, in action. He was the *s.* of a French officer and historian and was educated at Stanislas College and the École Polytechnique in Paris. He had an aptitude for science, mechanics and mathematics; was drawn to aviation by the achievements of Santos Dumont, Bleriot, Paulhan and others. When the World War began in 1914 he enlisted in the aviation corps as a student mechanic and became one of the most remarkable airman of his time. His first flights were at the Pau School, and after an apprenticeship there he joined the celebrated French 'Storks' as a corporal. He soon acquired fame for his aerial battles with German airmen from the Aisne to Verdun and over the Somme and Belgium. His active air service lasted from June 8, 1915, to September 11, 1917, ending with his life at 23, in which period he brought down 53 enemy machines without taking account of those that fell too far from the official observers, those only disabled, or those that reached safety with a pilot or passenger dead. His last flight was with a German biplane over Poelcapelle, Belgium, in the Ypres Sector, where he was found dead in his wrecked machine, shot through the head. His body and machine disappeared in the heavy shelling which subsequently ploughed the district and were never found.

GUYON, JEANNE MARIE BOUVIER DE LA MOTHE (1648-1717), Fr. mystic; disciple of the doctrine of quietism or spiritual perfection; persecuted and imprisoned for her opinions, which were regarded as heretical; wrote *Autobiography* and numerous works..

GUYOT, YVES (1843), Fr. journalist and publicist; first to cast suspicion upon the verdict in the notorious Dreyfus trial, in the *Siecle*; pub. several works on Socialism; member of Chamber of Deputies (1885-92); minister of public works (1889-92).

GWALIOR (24° 30′ N., 77° 50′ E.), native state in Central India, consisting of several detached districts; situated partly in basin of river Jumma and partly in that of the Nerbudda; drains into Bay of Bengal and Arabian Sea; area, 29,047 sq. miles. Capital, Gwalior, in the N. At capital stands famous old citadel, on precipitous rock. Other towns are Dhar and Indore in the S. Pop. 3,200,000.

GWYN, NELL, ELEANOR (1650-87), Eng. actress; originally an orange-seller; famed for her performances in comedy; mistress of Charles II.; had two sons, one of whom became Duke of St. Albans.

GYGES (687-54 B.C.), king of Lydia. Plato tells that he was a herdsman who discovered a magic ring which rendered the wearer invisible. With its aid he assassinated the king of Lydia and seized the throne.

GYLIPPUS (fl. V. cent. B.C.), Spartan general who rescued Syracuse from Athenians, 414 B.C.; Athenian captives were then slain, possibly by G.'s advice.

GYMNASIUM, a place used for the performance of athletic exercises; in ancient Greece it was an elaborate combination of halls and courts for exercises, wrestling, and running, with baths and porticos, frequented by philosophers, who instructed the youths who took part in the exercises (*e.g.*), the Academy, where Plato taught; in modern Germany the g. is an advanced school, preparing for the univ's, corresponding to the public schools and high schools of Britain and America.

GYMNASTICS, athletic exercises practiced for improving the condition and development of the body, as opposed to athletic sports and games (*e.g.*), running, jumping, football, golf, into which the competitive element enters. G. were practiced by the Greeks as training for open-air sports and games, and recognized as of benefit to health, and a valuable adjunct to the moral and literary training carried on in the same buildings as the physical training. In mediæval times horsemanship, field sports, and exercises with arms took the place of the older and more systematic training of the body, and it was not until the second half of the XIX. cent. that the therapeutic value of g., as known to Hippocrates and Galen, was again recognized. Physical exercises are regularly taught in Britain in the elementary schools, while the higher schools and univ's have gymnasia fitted up with apparatus, which is less elaborate now than it was a few years ago.

Clubs for gymnastic exercises are common everywhere, and g. play an important part in the training of the army. G. are practiced with benefit for such conditions as digestive derangements and (under medical supervision) diseases of the lungs and heart. The dumb-bell, which has been employed since Elizabethan times, is the most generally popular gymnastic apparatus, its weight being easily proportioned to the person using it, and bar-bells, or two-handed dumb-bells, and Indian clubs are also much used. The vaulting-horse, parallel bars, trapeze, swinging rings, horizontal bar, and bridge ladder are more elaborate gymnastic apparatus on a larger scale, but, although these and similar apparatus have been very popular for many years, there is a tendency to-day to discard them in favor of free gymnastic exercises without any apparatus. In the United States, France, Germany, Sweden, Denmark, Switzerland, Italy, among other countries, g. are much practiced and much esteemed for hygienic purposes, and many competitions of gymnastic teams are held, the Olympic Games even including such competitions among its events.

GYMNOSPERMS, naked - seeded plants in which the seed lies on the surface of the *carpel*, and is not enclosed in an *ovary*. They form the smaller, less developed and more ancient of the two divisions of the *Phanerogams* or *Spermaphyta* (seed-bearing plants). G's are divided into four classes, all trees or shrubs—(1) *Conifers*; (2) *Cycads*; (3) *Gnetales*; (4) *Ginkgoales*. These classes, although differing widely in appearance, have in common with each other and their fossil ancestors—(*a*) exposed *ovule* at which the pollen can get directly; (*b*) simplicity of wood structure; (*c*) formation of *endosperm* before fertilization.

GYMPIE (26° 15′ S., 152° 38′ E.), town, Queensland, Australia; gold-mining center. Pop. 12,000.

GYNECOLOGY, GYNÆCOLOGY, the branch of medicine which deals with the diseases peculiar to women, a subject which has received much attention since ancient times, Egyptian and afterwards Gk. and Rom. physicians making a special study of it, while Galen gave it a place of some importance in his works. The rise and development of modern scientific g. began about the first half of the XIX. cent., when Récamier (1774-1852) began to advocate the use of the speculum and sound, and Simpson, Hughes Bennett, and others did much to advance its progress.

GYP, psuedonym of Gabrielle Riquetti de Mirabeau, Comtesse de Martel de Janville (1850), Fr. novelist; her works deal freely with social conventions, and include *Chiffon's Marriage*, *Petit Bob*, *Mlle. Eve*, *Elles et Lui*.

GYPSIES, name given to a nomadic race found all over Europe, great part of Asia, in N. and S. America, Africa, and Australia. They have also been known in England as 'Egyptians (of which Gypsy is a diminutive), 'Greeks, 'Heathens,' 'Bohemians,' etc. The g. calls himself *Romany* or 'Rómano'; and his language, which is practically the same in all countries, is *Romani chiv*. Where the g. first came from is unknown. They are generally described by themselves as of *Little Egypt*, which some students have identified with Epirus. They probably first appeared in Europe in the early part of the XIV. cent., and seem to have reached England at about its close. It is recorded that certain g's danced before James V. of Scots at Holyrood; and, in 1540, the same king granted permission to 'oure louit Johnne Faw, lord and erle of Litill Egipt,' to punish any offenders against the Romany laws. At first they seem to have been well received in Europe, and were known for skilled metal-workers, but subsequently charges of kidnapping and other crimes were brought against then, and in England and other places they were mercilessly hunted down and imprisoned or put to death. In past times these nomads used to be famed for their skill in music and dancing, besides metal-working. Now the chief male occupation is horse-dealing; the female, fortune-telling and basket-making. Amongst common surnames are Smith, Boswell, Stanley, Lee, and Lovell. The Eng. g's conform to no religion; and their moral code is far from strict. Amongst physical characteristics may be noted lithe figures, olive skin, dark, lustrous eyes, exceedingly fine teeth, and black or dark hair.

GYPSUM, $CaSO_4+2H_2O$, mineral composed of hydrated sulphate of lime; occurs abundantly in the more recent sedimentary rocks, although it may occur in any geological age. Varieties: *alabaster*, which is white and resembles marble; *selenite*, transparent and crystalline; *satin spar*, has pearl-like lustre. G. contains a large amount of water, and when this is evaporated off in kilns plaster of Paris is left. This, when mixed with water again, quickly sets, and is used for moulds, casts, etc. G. is also used in a powdered form as agricultural manure, and in the manufacture of porcelain.

GYPSY MOTH. An insect belonging to the genus Porthetria. First described by Linnaeus in 1758, and called by him Bombyx dispar. The male moth is brown and flies freely, while the female is white and does not fly. It is very abundant in France, Germany and Russia, where it is considered a pest owing to the great damage done by the caterpillars to trees, shrubs and plants. Even conifers are sometimes attacked and killed. The caterpillars hatch in the spring and become full-grown about the middle of July. They pupate in loose cocoons and the moth emerges in about two weeks. The female lays her eggs in August, depositing them on tree trunks, fences, and even rocks. The eggs occur as yellow, horny masses. The moths were introduced into this country by an unfortunate accident. In 1869, Leopold Trouvelot was experimenting with various breeds of silkworms, at Medford, Mass., with the purpose of developing a hybrid resistant to the pebrine silkworm disease. Some of his specimens accidentally escaped, among them being the Gypsy Moth. Trouvelot, realizing the possibility of serious consequences, promptly informed the authorities, but little was done to combat the moth until 1889, when the ravages caused by the caterpillars in the state of Massachusetts began to cause alarm among farmers and landowners. In the following year, the state legislature appointed a commission for the extermination of the insect, and later the work was carried on by the State Board of Agriculture. For ten years the fight was carried on, at a cost of about a million dollars. By 1900 the ravages of the insect had been so greatly reduced that public opinion would no longer permit further expenditures. In recent years, the insect has again increased in numbers, and there seems every probability that the fight against it will have to be renewed with increased persistence. Whether it can ever be exterminated seems doubtful and only by constant watchfulness can its numbers be kept within reasonably safe limits.

GYROSCOPES and **GYROSTATS** are instruments by means of which the dynamics of a rotating body such as the earth or a spinning-top have been investigated. In the *Gyroscope*, invented towards the end of the 18th cent., the principal axis of rotation always passes through a fixed point, and accordingly the rotating wheel or disk is mounted in *gimbals*. The *Gyrostat* was invented by Kelvin to illustrate the movement of a rotating body left free to wander about on a horizontal plane. It illustrates the action of a top spun on a table. When the gyroscope is rotated at a very high speed it resists any forces coming from without and tending to change its axis of rotation. Hence it can be used to give stability to a moving body through its inertia. The *moment of inertia* can be calculated, and is equal to the product of the mass of each particle of the body into the square of its distance from the axis of rotation. It will, therefore, to some extent depend on the geometrical shape of the body.

The *radius of gyration* of a rotating body is the distance from the axis of rotation at which, if the whole mass of the body were concentrated there, the energy of rotation of the body would be the same as it really is. The first practical application of the gyroscope was Sersen's apparatus for providing a false horizon at sea when the real one was obscured by fog. It consisted of a top with a highly polished upper plane surface. *Centrifugal machines, cream separators*, are really tops held in a frame and obliged to rotate about a vertical axis—(*i.e.*,) they are an application of the gyrostatic principle in which one degree of freedom is suppressed. Other modifications of this principle are used on the platforms of quick-firing guns and for searchlights on board ships. A gyroscopic fly-wheel travels in its original direction only when it is perfectly free in all directions in space. In the form of a small heavy wheel fixed in gimbals rotating at at least 2,000 revolutions per minute it is used to control the course of a torpedo or submarine. The fly-wheel acts on a valve to which rudders are attached. The rolling of a ship can be neutralized by the presence of a gyrostat the movement of which is restrained in one direction, and the same principle can be used to give stability to a mono-rail car. In 1911 the gyroscopic compass was invented, and the gyroscope was used for steadying cinematograph cameras. Bicycle wheels furnish an instance of gyrostatic movement. Any deviations from the original direction of the movement can be corrected by forces of the required direction acting through the handle-bars. Many complicated composite movements can be explained by the fact that, given forces acting in the proper direction, it is possible to overcome the inertia due to gyrostatic movement. The earth can be considered as a large top with a slow backward motion of the equinoctial points due to the attractive force by the sun, moon, and planets. The axis of the earth describes in space a conical motion in about 26,000 years. Various applications of the gyroscope have been used to

demonstrate the inclination of the earth's axis. Large gyroscopes installed in ocean vessels are found to stabilize the motion and to prevent seasickness.

GYTHIUM (36° 46′ N., 23° 34′ E.), seaport town of ancient Greece, on Gulf of Laconia; was Spartan naval station; now mostly submerged.

H

H, eighth letter of the Eng. alphabet; derived from the Phoenician, and originally consisted of two upright and three transverse bars. It is an aspirate, or simple breath sound, neither consonant nor vowel; sounded in words of native origin, but in a few words derived from the Latin, such as 'hour' and 'honour,' mute.

HAAKON, OR HACO, name of several kings of Norway. (1) H. I. *the Good* 915-61, passed his youth in England, and on return to Norway dethroned his brother Eric; defeated Danes, and was converted to Christianity; was murdered by sons of Eric. H. IV. 1204-63 won over-lordship of Iceland and Greenland; was defeated by Alexander III. at Largs, Scotland 1263, dying in Orkneys on way home. H. VII. 1872, *s.* of King Frederick VIII. of Denmark, became King of Norway on its separation from Sweden 1905; married Princess Maud Charlotte 1869, *d.* of Edward VII.

HAAN, WILLIAM GEORGE (1863), American army officer. *B.* at Crown Point, Indiana, Oct. 4, 1863. Graduated from U. S. Military Academy 1889; Captain U. S. artillery corps 1901; major 1907, colonel 1916, brigadier-general 1917 and major-general 1921. Active service Cuba and Philippines 1898-1901; General Staff 1903-1905; Chief of Staff Eastern Dept. 1912-1914; Commander 57th Artillery Brigade corps Camp MacArthur, Texas, 1917, of 32nd Division N. G. 1918; brigadier general U. S. A. 1918, commander 3rd Division offensives Marne and Argonne, France; of 7th army corps, Germany, Nov. 1918 to April 1919; Assistant chief of Staff U. S. A. June, 1919. Decorations D.S.M. (U.S.) and Legion of Honor and Cross, France.

HAARLEM (52° 22′ N., 4° 40′ E.), town, capital of N. Holland, Netherlands, on Spaarne; the Cathedral of St. Bavo (Groote Kerk) dates from XV. cent.; has collections in art and science, an academy of science, and several royal schools; trade in flower bulbs; surrendered to the Spaniards, 1573. Pop. 1921, 76,858.

HAARLEM LAKE (52° 20′ N., 4° 40′ E.), Dutch Harlemmer Meer, a former shallow lake of the Netherlands, about 20 miles in length, 2 miles S.E. of Haarlem; drained in 1853.

HAAS, JOHN A. W. (1862), College President. *B.* in Philadelphia. In 1884 Backelor of Arts, University of Pennsylvania, 1887, Master of Arts and Bachelor of Divinity. Was a student of Lutheran Theological Seminary. Ordained Lutheran Minister. From 1888-1896, pastor of Grace Church, 1896-1904 St. Pauls Church, New York. Since 1904, professor of philosophy, and president of Muhlenburg College. University preacher at Harvard College. Member of Association of College Presidents of Pennsylvania. Was president of Lutheran Ministerium of Pennsylvania. Author of Commentary on the Gospel of Mark in Lutheran Commentary, 1895, Bible Literature, 1903, Trends of Thought and Christian Truth, 1915. Contributor and co-editor of Lutheran Cyclopaedia, 1899. Biblical Criticism, 1903.

HAASE, FRIEDRICH (1827-1911), Ger. actor; retired, 1898; one of the leading players of the modern Ger. stage.

HAASE, HUGO (1863-1919) German Socialist; *b.* at Allenstein, E. Prussia, of Jewish extraction; studied law at Königsberg Univ.; entered Reichstag in 1897; succeeded Bebel as president of Social Democratic party; during Great War seceded from main body of Socialist party on the question of voting war credits in the Reichstag 1915; one of the authors of the revolution which brought about the abdication of the Kaiser; co-operated with Majority Socialists in formation of a People's Government; shot on steps of Reichstag by a Viennese named Voss Oct. 8, 1919; *d.* from blood-poisoning Nov. 7.

HABAKKUK, eighth minor prophet of Old Testament, of whom personally nothing is known, but probably a Levite. Book is dramatic in form, consisting of colloquy between prophet and Jehovah; former begins by lamenting surrounding violence and is told that

God has raised up Chaldaeans as instrument of judgment; prophet then complains of greater wickedness of Chaldaeans, and is told that they shall perish after accomplishment of their task. Then follows a series of woes pronounced against Chaldaeans; and in conclusion the prophet breaks into a sublime lyrical poem, describing a divine theophany. H. is quoted in *Acts*, *Romans*, *Galatians*, *Hebrews*.

HABBERTON, JOHN (1842-1922), Amer. novelist and journalist; chief work, *Helen's Babies*, 1876.

HABEAS CORPUS, in law, writ protecting personal liberty of the citizen. Where a person is detained on criminal charge without being brought to trial, or where he is unlawfully detained by private individuals, any one may on his behalf apply for writ of H.C. commanding warden of prison, or person detaining the individual on whose behalf the request is made, to bring him before the court in order that the reasons for his detention may be investigated; if there by no sufficient reason, the court will then order him to be set at liberty, or, if he is a child, will order him to be given up to his lawful guardians. Writ must be issued by judge on good reason being shown.

The act was passed in 1679. The right of habeas corpus is secured by the Constitution of the United States, and has been incorporated into the jurisprudence and Constitution of every State.

HABERDASHER, retail dealer in mens' furnishings; the name is used by Chaucer.

HABIBULLAH KHAN (1872-1919), Amir of Afghanistan; succeeded to throne on death of father, Abdur-Rahman 1901; was not at first inclined to be friendly with Ind. Government, but attitude was changed as result of visit to India 1907. During World War he kept country neutral, though section of nobility headed by his *b.* wished to intervene in Turkey's favour; was assassinated Feb. 20, 1919.

HABSBURG, OR HAPSBURG, Ger. noble family, deriving name from castle of Habsburg on Aar, built about 1020. Rudolph of Habsburg, who became Holy Roman emperor in 1273, acquired Austria in 13th cent.; his descendants held empire at various times, and from 1438 the imperial title remained practically hereditary in house of Habsburg. Family was remarkable for its continuous acquisition of territories in the E.; it annexed Styria, Carinthia, Tyrol; and Bohemia and Hungary were both subject to it for some time. Practice of subdivision frequently weakened family, but all their dominions were reunited under Frederick III. and his *s.* Maximilian. Latter married Mary of Burgundy 1477, and established his family as great European power. In reign of Charles V. Spain was united to empire; when he abdicted 1556 it was transferred to his *s.* Philip, while the empire passed to his *b.* Ferdinand. Family thus divided into Spanish (elder) and Austrian (younger) branches. Span. line became extinct with the death of Charles II. of Spain in 1700; Austrian Habsburgs claimed throne, but war with France resulted in its passing to Bourbons. Austrian Habsburgs were founded by Ferdinand I.; lands were divided among his sons at his death, but were reunited under Ferdinand II. 1619. Male line became extinct with the death of Charles VI. in 1740; he had previously issued document known as the Pragmatic Sanction, securing succession of his *d.* Maria Theresa. She married Francis of Lorraine, who became emperor in 1745. Henceforth Habsburg-Lorraine family were Holy Roman emperors till 1806, and from that date till conclusion of World War 1918 emperors of Austria.

HACHETTE, JEANNE, famous Frenchwoman who, when the Burgundians, in 1472, had practically reduced Beauvais, tore down their flag and reinspired the garrison to resistance.

HACKENSACK, a city of New Jersey, in Bergen co., of which it is the county seat. It is on the New York, Susquehanna and Western, and the New Jersey and New York railroads, and on the Hackensack River, 14 miles northwest of New York City. It is chiefly a residential city but has important industries including the manufacture of brick and silk. The public buildings include a court house, public library, and a high school. The city is connected with neighboring towns and cities by electric railroads. A settlement was made here by the Dutch in the latter part of the 17th century, and during the Revolution Hackensack was occupied in turn by the British and American armies. Pop. 1920, 17,667.

HACKNEY, metropolitan borough of London, England, 3 miles N.E. of St. Paul's. Pop. 1921, 222,159.

HACKNEY, horse for riding or driving as distinguished from finer breeds, such as hunters or racehorses; carriage for hire; 'to hackney' is to make common, by frequent use.

HACKETT, FRANCIS (1883), Literary Critic. *B.* in Ireland. Educated at

Clongowes Wood College, Kildare, Ireland. In 1900 came to America. From 1906-1909 editorial writer, Chicago Evening Post. Editor, 1909-1911, Friday Literary Review of same paper. Since 1914 associate editor of New Republic. Author of, Ireland, A Study of Nationalism, 1918. Horizons, 1918, The Invisible Censor, 1920.

HACKETT, JAMES HENRY (1800-1871), American actor. *B.* in New York, March 15, 1800; *d.* in Jamaica, Long Island, Dec. 28, 1871. He made his first stage appearance in 1826 and soon became noted for playing Yankees and Westerners. In 1832 he first acted Falstaff, a part in which he was considered above all rivals in his day. He played in England also with marked success. During his management of various theatres he made a considerable fortune. Publications: 'Notes and Comments on Shakespeare', 1863. See IRELAND, 'ACTORS AND ACTRESSES OF GREAT BRITAIN AND THE UNITED STATES' NEW YORK, 1886.

HACKETT, JAMES KETELTAS (1869), Actor-Manager. Bachelor of Arts of College of the City of New York, 1891. Student at New York Law School. In Philadelphia, 1892 made debut on stage. Became a leading man at twenty-four. His most successful play, 'The Prisoner of Zenda'. Has been interested in many theatres including Grand Opera House, Chicago; Tremont Theatre, Boston; Savoy Theatre, New York. Producer of many plays as manager or actor among which are 'The Walls of Jericho', 'Rupert of Hentzau', 'The First Gentleman of Europe', 'The Grain of Dust,' and 'Craig Kennedy'. Manager of many stars. In 1919 awarded the Red Cross Badge for exceptional service.

HADAD, name found in Bible as Ben H. (*s.* of H.); kings of Damascus called Ben H. possibly assumed title from Syrian god H.

HADDINGTON (55° 57′ N., 2° 47′ W.), county town on Tyne, Haddingtonshire, Scotland; ancient royal burgh; among chief buildings are the XV. cent. abbey church ('Lamp of Lothian'), Corn Exchange, and Knox Memorial Institute; important grain market; corn-mills. Alexander II., John Knox, Samuel Smiles, and Jane Welsh Carlyle were natives. Pop. 1921, 4,053.

HADDINGTONSHIRE, OR EAST LOTHIAN (55° 55′ N., 2° 45′ W.), maritime county in S. E. of Scotland, bounded by Firth of Forth, Ger. Ocean, Berwickshire, and Edinburghshire; total area, 280 sq. miles; county town, Haddington. Of great historical interest, with numerous antiquities. Royal burghs are Haddington, Dunbar, and North Berwick. Pop. 1921, 47,487.

HADDOCK (*Gadus oeglefinus*); fish found plentifully in N. hemisphere; belongs to Cod family; length of male, *c.* 2 ft., of female (which lays about one million pelagic eggs), *c.* 15 inches.

HADEN, SIR FRANCIS SEYMOUR (1818-1910), Eng. surgeon and artist; pres. and part founder of the Royal Society of Painter-Etchers; stands in the foremost rank of etchers, and author of numerous works on etching.

HADERSLEBEN, DAN. HADERSLEV (55° 15′ N., 9° 10′ E.(, seaport town, Schleswig-Holstein, Prussia, on inlet of Little Belt; iron foundries. Pop. 13,000.

HADES, see HELL.

HADING, JANE (1859); Fr. actress; has played with Coquelin; achieved great success in *Le Maitre de Forges, La Chatelaine, Le Demi-monde,* etc.; toured in U. S.; acted in London in *Sapho* and *Retour de Jerusalem,* etc.; one of the most famous *comediennes* of her day.

HADJ, HAJJ, Arabic name for the pilgrimage to Mecca, the person performing it being afterwards known as Hadji. Pilgrimages to Jerusalem are also so called.

HADLEY, ARTHUR TWINING (1856), American university president. *B.* in New Haven, Connecticut, April 23, 1856. He graduated with highest honors from Yale in 1876 and studied at the University of Berlin 1878-1879. (LL. D. Yale, Harvard, Columbia, Brown, and others). Lectured on railroad administration 1883-1886; professor of political science 1886-1891; politicial economy 1891-1899; president, Yale University 1899-1921; President Emeritus, 1921; Roosevelt professor in Berlin 1907-1908; lectured at Oxford University, England, 1914; president of the American Economic Association 1899-1900. Publications 'Freedom and Responsibility', 1903; 'The Standard of Public Morality,' 1907; 'Undercurrents in American Politics', 'The Moral Basis of Democracy', 1919.

HADLEY, HENRY K. (1871), American composer; *b.* at Somerville, Mass., in 1871. He studied music in Boston under S. A. Emery, and G. W. Chadwick and also in Vienna. In 1895 he was appointed instructor of music at the St. Paul School, Garden City, L. I. 'The Four Seasons' a symphony received the Paderewski and New England Conservatory of Music prizes; 'The Culprit Fay'

rhapsody for orchestras the prize from the Federation of Musical Clubs. He is the composer of over 150 songs, and of many overtures and a cantata, and two serious operas 'Safie' produced at Mayence and 'Izora, Montezuma's Daughter', also four comic operas. In 1907-1909 he was choir-master at the Mayence Opera House and also played his pieces in European cities. Conductor Seattle Symphony orchestra, 1909 and of the San Francisco Symphony 1911-1915.

HADLEY, HERBERT SPENCER (1872) Governor. *B.* in Kansas. In 1891 Bachelor of Arts of University of Kansas. At Northwestern University, Bachelor of Laws with first honors, 1894. From 1894-1898 practised at Kansas City. First assistant city counselor, 1898-1901. From 1901-1903 at Jackson County, Missouri, prosecuting attorney. From 1905-1909 was attorney-general of Missouri. Prosecutor in cases against the Harvestor Trust, Standard Oil Company, Insurance and Lumber Trusts and race track gamblers of St. Louis. From 1909-1913 governor of Missouri. From 1913-1915 was special counsel for railways W. of Chicago in federal valuations of railways. Since 1917, professor of law at University of Colorado. From 1919-1921 counsel for State Railroad Commission.

HADRAMUT (18° N.; 40° E.), district along S. coast of Arabia from Yemen on W. to Oman on E.; narrow belt of land, chiefly mountainous; many wadis, or valleys, without running water, except after rains; country irrigated by wells. Main productions are wheat, millet, indigo, dates, and tobacco. Chief towns—Shibam, Tarim, Keshin, and Makalla. Shrines of Kabr Salih and Kabr Hud visited by pilgrims. Pop. *c.* 150,000.

HADRIAN, PUBLIUS ÆLIUS HADRIANUS (76-138 A.D.), emperor of Rome. After distinguishing himself in wars in Dacia and holding various important offices of state, he succeeded Trajan as emperor in 117; soon afterwards he gave up his claim to Armenia, and made peace with Parthians, to whom he retransferred Assyria and Mesopotamia. He spent several years of his reign in visiting all the provinces of his empire, and in course of his first journey, which he began *c.* 119, he visited Britain, where he caused a wall, Hadrian's Wall, to be built beteeen Bowness-on-Solway and Wallsend-on-Tyne, to secure Rom. provinces to the S. from incursions of Caledonians. The wall was repaired by Severus and considerable portions remain. He lived for some time at Athens, where he built magnificent temple; founded Ælia Capitolina on site of Jerusalem; put down Jewish insurrection, 134.

HADRUMETUM (*c.* 35° 50′ N., 10° 30′ E.), ancient city, N. Africa; on E. coast Tunisia; originally a Phoenician and later a Rom. colony; site now partly occupied by modern Susa.

HAECKEL, ERNEST HEINRICH (1834-1919), Ger. biologist; prof. of zool. at Jena. His biological achievements lay in two main directions; minute systematic classification and general biological philosophy. In the first, he pub. masterly monographs on several divisions of protozoa, sponges, and coelenterates; in the second, propounded his 'gastraea' theory, based upon his 'fundamental biogenetic law'—that the ontogeny or development of the individual is a recapitulation of the phylogeny or development of the race. This theory has won wide acceptance among naturalists, and though it has undergone some modifications, still lies at the base of all modern zoological classifications. Of Haeckel's more popular works, his *History of Creation* (4th Eng. ed. 1892) has been widely read. *The Last Link*, 1899 contains his final conclusions on the origin and descent of man, as based upon the latest available palaeontological discoveries.

HÆDUI, ÆDUI, Gallic people dwelling between Saône and Loire; gave allegiance to Julius Caesar.

HÆMATITE, OR HEMATITE (Ger. *Hamin*, blood), a distinct iron ore of fibrous structure, consisting chiefly of peroxide iron, and found in Cumberland, Lancashire, in Spain, Scandinavia, and near Lake Superior. Thefe are two varieties, red and brown, the former being variety of red oxide, and giving the name on account of its blood-like colour.

HÆMATOCELE, collection of blood in the tunica vaginalis of the testis or in the spermatic cord, due to injury or, rarely, to maligannt disease; treatment is rest, cold wet dressings or ice-bag to promote absorption, or, in chronic cases, a slight operation to remove the clot may be necessary.

HÆMOGLOBIN. See BLOOD.

HÆMORRHOIDS. OR HEMORRHOIDS. SEE PILES

HAESELER, GOTTLIEB, F. A., COUNT VON (1836-1919), Prussian field-marshal, fought against Denmark, 1864, and Austria, 1866; commanded an army corps in Franco-Ger. War, and

was oberquartiermeister of the army of occupation, 1871; afterwards was given command of 11th Begiment of Uhlans, and was also engaged on compilation of official history of the war. At the outbreak of World War was attached to the crown prince as adviser, particularly in the Argonne and at Verdun, but retired owing to opposition to continuance of the operations at the latter place. Later, while he was engaged at War Office in Berlin, he was responsible for death warrant of Nurse Edith Cavell.

HÃFIZ (*d.* 1389), the greatest of Persian lyric poets. His real name was Muhammad Shams ed-Din; *b.* and *d.* at Shiraz, but little is known of his life. His book, or *Divan*, consists of *ghazals* (short odes), which, though sensuous in tone, are claimed to be mystical in meaning, and impregnated with Sufi philosophy. They are known by heart in Persia. Eng. trans. by McCarthy, Payne, and others.

HAFNIUM. An element isolated in 1913 by Dr. Alexander Scott of the British Museum from a black sand obtained from New Zealand. It was not definitely identified by him as a new element until 1922, when the Danish chemists, Coster and Hevesy, discovered the same element in xirconium minerals. The claim is also made that the element was discovered several years previously by Prof. G. Orbain, a well known French chemist, but there appears to be some doubt as to whether this element, named 'celtium' by the professor, is identical with the hafnium of Coster and Hevesy. The element is stated to be very similar to the metal zirconium and has an atomic weight of approximately 180. Its oxide, as prepared by Dr. Scott, is a cinnamon colored powder. If the new element is found to have a commercial value, it can probably be produced in large quantities, as the deposit of sand in New Zealand, from which it was isolated, is reported to be seven miles in length and of considerable depth, and it is also believed to exist in appreciable quantities in some Norwegian zirconium minerals.

HAGEDORN, HERMANN (1882), American Author. *B.* in New York. Educated at Harvard and Columbia Colleges and University of Berlin. From 1909-1911 at Harvard, instructor of English. Writer of one act plays produced by Harvard Dramatic Club. At Harvard in 1917 delivered the Phi Beta Kappa poem An Ode of Dedication. Author of 'The Silver Blade' 1907: 'The Woman of Corinth', 1909; 'A Troop of the Guard', and Other Poems, 1909; 'Barbara Picks a Husband', 1918; 'The Boys Life of Theodore Roosevelt', 1918; 'Life of Roosevelt', 1919; 'That Human Being', (Leonard Wood), 1920; 'Roosevelt in the Bad Lands', 1921.

HAGEN (51° 22′ N., 7° 28′ E.), town, Westphalia, Prussia; ironworks; textile industries. Pop. 1919, 92,862.

HAGENAU (48° 35′ N., 7° 48′ E.), town, on Moder, Alsace-Lorraine, Germany; cotton and woollen industries. Pop. 18,000.

HAGENBECK, KARL GOTTFRIED WILHELM HEINRICH (1844-1913), dealer in wild animals; organized expeditions in quest of big game; inaugurated 1875, ethnographical exhibitions; acquired large tract of land at Stellingen, near Hamburg 1902, for animal park in which animals were allowed to roam freely over restricted areas; system now widely adopted in zoological gardens.

HAGERSTOWN, a city of Maryland, in Washington co., of which it is the county seat. It is on the Baltimore and Ohio, the Cumberland Valley, the Norfolk and Western, the Western Maryland railroads, and on Antietam Creek. It has important industries including the manufacture of knit goods, pipe organs, machinery, steam engines, etc. Hagerstown is the trade center for the western part of Maryland. It has a courthouse, a high school and other public buildings. Pop. 1920, 28,029.

HAGGADA, part of Talmud, which gives ethical and hist. commentary on and amplification of Bible; to it is joined the *halkaha*, or legal exposition of the Scriptures; it is of great literary value.

HAGGAI, first Hebrew prophet after the return from Exile; contemporary of Zerubbabel and Joshua, whom he was inspired to support in rebuilding of Temple, the reconstruction having been suspended for fourteen years. His prophecy dates from 520 B.C., and consists of four parts: the first reproves apathy of the people in not carrying out the work; the second gives an assurance that the new temple shall equal the glory of the former one; the third promises blessing; and fourth contains message of encouragement for Zerubbabel. H. is quoted in *Hebrews* 12_{26}.

HAGGARD, SIR HENRY RIDER (1856), Eng. novelist; secretary to governor of Natal 1875; member of special commission to the Transvaal 1877; with General Brooke hoisted Brit. flag over S. African Republic at Pretoria 1877; master, High Court of the Transvaal 1878; returned to England and studied law; became barrister 1884; investigated agricultural conditions in

England 1901-2; Brit. Government special commissioner to report on Salvation Army settlements, U.S., etc. 1905; travelled round world as member of Dominions Royal Commission 1912-17. The most famous of his numerous publications are *King Solomon's Mines* 1886, *She* 1887, *Allan Quatermain* 1888, *Queen Sheba's Ring* 1910. He has also written on land questions.

HAGGIS, Scots pudding, consisting of sheep's lung, heart, and liver, chopped fine, and mixed with oatmeal, suet, and spices; boiled for three or more hours in a sheep's stomach.

HAGIOLOGY, as the critical study of lives of saints, has only existed for two cent's, but collections of lives were made from time of Eusebius; called *menologies* in Eastern and *legendaries* in Western Church; among important collections are *Sanctorum priscorum patrium vitoe* (pub. by Lippomano, 1560) and *Vitoe patrium* (by Rosweyde, 1615).

HAGONOY (14° 25′ N., 120° 45′ E.), town, Philippine Islands; fertile region; produces rice, Ind. corn, and sugar; woven fabrics. Pop. 20,000.

HAGOOD, JOHNSON (1873), Army Officer. *B.* in South Carolina. Educated at University of South Carolina, and a graduate of United States Military Academy. Second lieutenant of second artillery in 1896 and was promoted through the grades to Brigadier-General in 1921. From 1896-1901 did garrison duty in Rhode Island, Connecticut and South Carolina. From 1901-1904 was instructor in department of philosophy, United States Naval Acadmy. From 1912-1913 was commander of Fort Flagler, Washington. Was in France during World War. In battles on British, French and American Fronts. Decorated in 1919 with Distinguished Service Medal. Inventor of Hagood tripod mounting mortar deflection and other apparatus for sea-coast defense.

HAGUE, THE (Dutch's *Gravenhage*), cap. of Netherlands (52° 3′ N., 4° 18′ E.), 2 m. from North Sea; traversed by numerous canals; royal palace, castle of Counts of Holland (Dutch Parliament House), famous picture-gallery, museums, fine Bosch Park, etc.; originally a hunting lodge of Counts of Holland, 12th cent.; numerous treaties arranged here; Triple Alliance between England, Sweden, and Netherlands 1668; peace between Austria, Spain, and Savoy 1717; identified with peace movement; famous Peace Conferences 1899, 1907; Carnegie Palace of Peace completed in 1913; but for the World War a Peace Conference would have been held in 1917. Chief industries, copper and lead smelting, iron foundries, printing works, carriages, gold and silver lace. Pop. (including Scheveningen on the coast), 1921, 353,286.

HAGUE, ARNOLD (1840-1917), American geologist. *B.* in Boston, Oct. 3, 1840; *d.* 1917. Graduating from the Sheffield Scientific School, Yale, after three years study in Germany, he was appointed assistant-geologist of the United States explorations of the 40th parallel. Author of 'Volcanic Rocks of the Great Basin', 1884. 'The Volcanic Rock of Salvador,' 1886; 'Geology of the Yellowstone Park', 1895; 'Atlas of the Yellowstone Park', 1904, etc.

HAGUE TRIBUNAL. See ARBITRATION, INTERNATIONAL; PEACE MOVEMENT.

HAHN-HAHN, IDA, COUNTESS VON (1805-80), Ger. novelist; her stories are sentimental and deal chiefly with aristocratic life. The best are *Ulrich, Grafin Faustine,* and *Eudoxia* (Eng. trans. of two last).

HAHNEMANN, SAMUEL CHRISTIAN FRIEDRICH (1755-1843), a German physician and founder of homoeopathy, *b.* at Meissen, in Saxony. He studied medicine at Leipzig and Vienna, and took his degree in 1779 at Erlangen. He practised first at Dresden, then, in 1789, settled at Leipzig. He was not satisfied with the state of the science of medicine and in 1796 advanced a new principle, 'the law of similars,' *i.e.* that diseases should be treated by those drugs which produce symptoms similar to them, in the healthy. Four years later he published his doctrine on a system of smaller doses of drugs. In 1810 his chief work was printed, *Organon der rationellen, Heilkunde,* explaining this system, which he named homoeopathy. The hostility of the apothecaries forced him to leave Leipzig and find protection with the Grand-duke of Anhalt-Köthen. Fourteen years afterwards he went to Paris and practised homoeopathy with great success.

HAIDINGER, WILHELM KARL, RITTER VON (1795-1871), Austrian mineralogist and geologist; *b.* Vienna; came to live at Edinburgh, 1822; app. Counsellor of Nimes, 1840, and lectured on mineralogy, 1843; discovered optical appearances known as 'H's brushes.'

HAIDUK.—(1) Hungarian infantry soldier; term applied in XVI. cent. to mercenary soldiers who protected frontiers against Turks, and received various privileges as reward. (2) Retainer.

HAIFA (32° 48′ N., 35° 1′ E.), seaport

town, ancient *Sycaminum*, Syria, on Bay of Acre, at foot of Mt. Carmel. Pop. 39,000.

HAIG OF BEMERSYDE (DOUGLAS HAIG), 1ST EARL (1861), *s.* of John Haig of Cameron Bridge, Fife; educated Clifton and Brasenose, Oxford (hon. fellow, 1915); joined 7th Hussars 1885; served in Sudan and S. African War; inspector-general cavalry, India 1903-6; general 1904 for distinguished service; director of military training 1906-7; director of staff duties at army headquarters 1907-9; chief of staff, India 1909-12; general officer commanding, Aldershot 1912-14. At the outbreak of the World War was placed in command of the 1st Army, which held the right of the Brit. line from the eastern suburbs of Mons to the little town of Binche, and contained six battalions of the Guards. At the battle of the Marne his army, after a hard struggle, dislodged the enemy at La Trétoire, and made large captures of guns and prisoners. During first battle of Ypres he rendered distinguished services, and on Dec. 15, 1915, succeeded Viscount French as commander-in-chief of the Brit. forces in France. Much of the success of the Allies was due to his uniformly friendly relations with the French, and to his ready acceptance of an Allied command with Foch as generalissimo. Made field-marshal on Jan. 1, 1917, and Knight of the Thistle in July. After brilliant advance of Aug. 1918, was awarded the military medal from France. Appointed March 1919, field-marshal commanding-in-chief the forces in Great Britain. Received Order of Merit June 1919, and in Aug. of the same year an earldom, the sum of $500,000 and the thanks of Parliament.

HAILES, DAVID DALRYMPLE, LORD (1726-92), Scot. historian; author of *The Annals of Scotland* 1776-79; *Antiquities of the Christian Church* 1783; and other works.

HAILSTONES. When water-drops, suspended in the air, are carried upward by air-currents there is a consequent fall in their temperature, and this may be so great as to cause them to freeze. While h's so formed are small they may still be carried upward, and more water will condense upon them until they are so large that they fall to the earth.

HAINAN, KIUNG-CHOW-FU (19° N., 109° 45′ E.), island in province of Kwang-tung, extreme S. of China, lying between China Sea and Gulf of Tong-king; extending *c.* 150 by *c.* 100 miles; capital, Kiung-chow (with port Hoihow). Island is almost entirely agricultural; centre and S. are mountainous, and earthquakes and typhoons occur; there are good harbours; exports include timber, rice, and sugar. Pop. *c.* 2,500,000.

HAINAUT, HAINAULT (50° 30′ N., 4° E.), province, Belgium; surface generally level; traversed by the Sambre, Scheldt, Dender, and Haine; rich coal-fields; fertile soil; agriculture and mining chief pursuit of inhabitants; capital, Mons. Area, 1437 sq. miles. Pop. 1921, 1,231,720.

HAINES, THOMAS HARVEY (1871), Psychologist. *B.* in New Jersey. Educated at Haverford and Harvard Colleges. From 1912-1913 at London, Munich and Zurich studied neurology and psychiatry. At Ohio State University from 1901-1915 assistant professor of philosophy and professor of philosophy. From 1913-1914 first assistant physician of Boston Psycopathic Hospital. At Ohio Bureau Juvenile Research, 1914-1917 clinical director. 1915-1920 at Ohio State University professor of medicine. From 1917-1918 at Camp Stewart and Camp Dix was psychological examiner Surgeon General of United States of America. Director in 1921 of Arizona Mental Hygiene Survey.

HAINICHEN (50° 58′ N., 13° 6′ E.), town, Saxony, Germany; centre of Ger. flannel manufacture. Pop. 7,500.

HAI-PHONG (20° 51′ N., 106° 39′ E.), seaport, Tong-king, Fr. Indo-China, on branch of Red River delta; rice. Pop. 20,000.

HAIR, a characteristic of all mammals, even if in some it is reduced to a few bristles on the lips, as in whales. It is a product of the superficial skin or epidermis, is nourished by blood-vessels, and consists of a spongy centre and a harder outer layer. In mammals the temp. of the body must be kept at a constant high pitch; hair conserves the heat gained at the expense of energy and checks excessive dissipation of heat by radiation. It sometimes undergoes profound modifications. Thus in the hedgehog and porcupine, belonging to different orders, it it develops into long, hard, and sharp spines, which are clearly specialized defensive structures. Only one kind of hair may be present, as in the cat, but often the long, coarse, apparent overhair is supplemented by a fine, soft, thick under-fur, as in seals. The double coat is developed in animals exposed to cold temperatures—*e.g.*, martens of N. American and Europe, Arctic and Antarctic foxes, the ermine from Asia and Europe, etc. Hair, like feathers, is seasonably moulted, and the winter coat, which is thickest and warmest, often

changes in northern animals to a colour matching or approaching that of the snow amongst which they move. Histologically, hairs are outgrowths of epidermis; develop in little pits (follicles) epidermis (root-sheath) forms inner layer of follicle; corium rises up at base of follicle as a vascular papilla; hair itself may be divided into body or shaft, and root; shaft has externally a cuticle of overlapping scales; beneath is pigmented fibrous layer, while sometimes in centre is dark-coloured medulla composed of angular cells. Root of similar structure, but enlarged, and consists chiefly of young growing cells. Each hair follicle has attached to it little bundle of muscular fibres by which it can be erected; when they contract under influence of emotion (*e.g.*, fear) produces 'goose skin.' Colouring of hair depends on nature and amount of pigment.

Human hair and beards are possibly sexual ornaments. Racial varieties are: curly or smooth, generally fair hair of N. Europeans; crisp and short, woolly, very black hair of most negroes; black coarse straight hair of Mongols, Chinese, Amer. Indians; crinkly black hair of Australian Blacks.

Chairs are stuffed with short horsehair; cloth is woven from long horsehair and hair of goats. especially the Angora variety. Felt, for roofing and packing for pipes, is manufactured from cowhair. Artists' brushes are made from hair of camel and sable, clothes brushes from hog bristles

HAITI, OR HAYTI, the second largest island in W. Indies (17° 37′-20° N., 68° 20′-74° 28′ W.), separated from Cuba (the largest) by the Windward Passage, and from Porto Rico by Mona Passage. Cap. Port-au-Prince. Haiti isl. is divided into two republics—Haiti in W., and Santo Domingo in E. Republic of Haiti, originally a Fr. colony, was formed in 1804. Language of whites is French; religion is R.C. In 1910 education was made compulsory. It possesses a small fleet and army. Surface is mountainous, ranges running to both coasts. Highest peak, Loma Tina (10,300 ft). These mountains are covered with pine, oak, and other forests—much valuable timber being produced. Rivers are not navigable. There are many large lakes. Earthquakes are frequent and hurricanes common; climate is hot in low-lying parts, but healthful elsewhere. Cotton, rice, maize, sugar, coffee are cultivated. Haiti is rich in minerals, gold, silver, iron, copper, etc., which are as yet undeveloped. Haiti was discovered by Columbus 1492; aboriginals were speedily exterminated by Spaniards; negroes introduced, many struggles between blacks and whites resulting.

Government is by chamber of deputies (99 members elected for two years by community) and senate (15 members chosen for six years by commons from list drawn up by electors and president). Both chambers choose president for four years. Since 1906 Haiti has been practically an American protectorate. Domestic turmoil resulted in the establishment of order by American marines. Payment of members obtains. Pop. of republic, 2,029,700; of isl., *c.* 2,500,000.

HAJIPUR (25° 41′ N., 85° 14′ E.); town, Muzaffarpur, Bihar and Orissa, India, on Gandak; has large river trade. Pop. 22,000.

HAKE (*Merluccius vulgaris*), fish common in Atlantic and Mediterranean; of predatory habits; member of Cog (*q.v.*) family.

HAKE, THOMAS GORDON (1809-95), Eng. poet; sometime engaged in medical profession; associated with the Rossetti circle; his volumes include *New Day Sonnets, Madeline.*

HAKLUYT, RICHARD (*c.* 1553-1616); Eng. geographer and ecclesiastic; having taken orders, he held several livings and became archdeacon of Westminister 1602. He was early devoted to the study of navigation. He was the intimate friend of Drake, Raleigh, Gilbert, and others. His *Divers Voyages* appeared in 1582; and his monumental work, *The Principal Navigations*, was pub. 1589-1600. He also wrote and trans. several minor works, and his unpublished MSS. were afterwards used by Samuel Purchas in his *Pilgrims.*

HAKODATE (41° 47′ N., 140° 51′ E.), seaport, island Yezo, Japan, on Bay of Hakodate; exports sulphur, dried fish, rice. Pop. 136,698.

HAKON. See HAAKON.

HAL (50° 43′ N., 4° 13′ E.), town, on Sienne, Brabant, Belgium; place of pilgrimage. Pop. 14,000.

HALAESA (*c.* 38° N., 14° 15′ E.); ancient town, N. coast of Sicily.

HALBERSTADT (51° 54′ N., 11° 3′ E.), town, Saxony, Germany; XIV. cent. cathedral; sugar, cigars, machinery. Pop. 46,000.

HALCYON, a poetical name for the kingfisher. According to fable, it laid its eggs in nests that floated on the sea, about the time of the winter solstice, and was said to have the power of charming the winds and waves during

the period of incubation. Thus the term 'halcyon days'.

HALBERT, HALBERD, military weapon, consisting of an axe-like head, and spike, fixed on a long pole being a combination of the bill and pike; first used in England in reign of Edward IV.; was commonly employed during reign of Henry VII.; did not fall into disuse until reign of George III.

HALDANE, JAMES ALEXANDER (1768-1851), Scot. preacher; *b.* Dundee; ed. Edinburgh; entered East India Co.'s service, and rose to be captain; left the sea about 1795 and became an itinerant preacher in Scotland; subsequently 1799, became head of a Congregational body in Edinburgh; in later years adopted Baptist doctrines.

HALDANE, ROBERT (1764-1842)' Scot. theologian; served in navy during Fr. war, then devoted himself to religion; helped to form 'Soc. for the Propagation of the Gospel.'

HALDANE OF CLOAN, 1ST VISCOUNT (RT. HON. RICHARD BURDON HALDANE), (1856), Brit. statesman; educated at Edinburgh and Göttingen; Grey scholar and Ferguson scholar in philosophy of the four Scottish universities 1876; called to Eng. bar 1879; Gifford lecturer in St. Andrews Univ. 1902-4; M.P. for Haddingtonshire 1885-1911; Q.C. 1890; P.C. 1902; counsel for United Free Church before House of Lords 1904; took office for first time as secretary of state for war 1905, and held it until appointed lord chancellor 1912-15. Has written *Essays on Philosophical Criticism* (with Prof. Seth), *Life of Adam Smith, Education and Empire,* 1902; *The Pathway to Reality,* 1905; is translator (with Kemp) of *Schopenhauer's World as Will and Idea* (3 vols.). As secretary for war he established the Territorial System, and practically created the British Expeditionary Force that went to France in 1914.

He resigned in the cabinet crisis of May, 1916, but continued to act as a member of the judicial committee of the Privy Council, and in a variety of ways assisted in the prosecution of the war.

HALDIMAND, SIR FREDERICK (1718-91), Brit. gen. of Swiss birth; entered Brit. Military service and served with distinction in America; Gov.-Gen. of Canada 1778-85.

HALE, EDWARD EVERETT (1822-1909), Unitarian clergyman and author. *B.* in Boston, April 3, 1922; *d.* June 10, 1909. He was pastor of the Church of the Unity 1845-1856; then of the South Congregational Society, a Unitarian Church, and pastor emeritus from 1901 until his death. He helped to organize the Kings Daughters, Look up Legion, etc., and edited Old and New, and Lend a Hand, periodicals. He is best remembered as the author of 'The Man Without a Country' which appeared in 1863, and published about 70 books. Among the best known are 'Philip Nolan's Friends', 'New England Boyhood', 'Historic Boston', 1898; 'Lowell and His Friends', 1999; 'Memories of 100 Years', 1900, and with his sister Susan Hale a series of travel books 'Family Flights Through France', etc.

HALE, EDWARD EVERETT (1863), University Professor. *B.* in Massachusetts. Bachelor of Arts of Harvard, 1883 and Doctor of Philosophy, Halle 1892. 1886-1890 at Cornell was instructor and professor of English. At University of Iowa, 1892-1895 professor of English. Since 1895 at Union College. Author of 'Constructive Rhetoric', 1896. 'Lowell', 1899; 'Dramatists of Today', 1905; 'Seward', 1910, 'Life and Letters of Edward Everett Hale', 1917.

HALE, EUGENE (1836-1918), American politician. *B.* in Turner, Maine, June 9, 1836; *d.* in Washington, D. C. Oct. 27, 1918. Admitted to the bar in 1857 he was a member of the Maine Legislature 1867-1868, and 1880; Congress 1868-1870 (in the last term chairman of the Republican Congressional Committee), delegate to the Republican National Conventions 1868, 1876, 1880. He declined the appointment of Postmaster-General in 1874 and of Secretary of the Navy in 1877. He succeeded Hannibal Hamlin in the U. S. Senate in 1881 and was re-elected 1887, 1893, 1899, 1905 and 1909. Retired in 1911.

HALE, FREDERICK (1874), United States Senator. *B.* in Detroit, Mich., Oct. 7, 1874. Graduating from Harvard University in 1896 A.B. he was admitted to the bar and has since practiced law in Portland, Maine. In 1904 he was elected to the House of Representatives, Maine; member of the Republican National Committee, 1912-1918 and was elected to the U. S. Senate 1917-1923.

HALE, HENRY CLAY (1861), American army officer. *B.* in Knoxville, Ill., July 10, 1861. Graduated from the U. S. Military Academy 1883; Colonel 20th Infantry, 1915; major-general, 1917; aid-de-camp to General Wesley Merritt at St. Paul, Chicago and Governor's Island 1893-1899; member General Staff 1903-1906; Philippines 1906-1909; adjutant-general Dept, of the Lakes 1909-1910; Dept. of Missouri, 1910-1911;

commander of Camp Zachary Taylor, Louisville, 1917; commander 84th Division A.E.F. France, 1918; of Combat Division, Germany, Dec., 1920 to Feb., 1922; major general 1921, commanding 1st Division U.S.A., Camp Dix, N.J.

HALE, JOHN PARKER (1806-73), Amer. statesman, Democrat, and pioneer Abolitionist; Free Soil candidate for presidency, 1852; faithfully supported Union and Lincoln.

HALE, LOUISE CLOSSER (1872), American actress and author. *B.* in Chicago, Oct. 13, 1862. Educated at the public schools of Indianapolis. She married Walter Hale the artist in 1899. First stage appearance was in Bernard Shaw's 'Candida' in 1895. She has since been identified with important productions in the United States and London. Author of 'The Actress', 1909; 'Her Soul and Her Body', 1911; 'We Discover New England', 1915; 'We Discover the Old Dominion', 1916, and 'An American's London'. 1920.

HALE, LUCRETIA PEABODY (1820-1900), American author. Sister to E. E. Hale (*q.v.*). *B.* in Boston, Sept. 2, 1920; *d.* there Jan. 12, 1900. She is best remembered as the author of stories for young people, and as the creator of the amusing Peterkin Family as described in 'The Peterkin Papers', 1882, and 'Last of the Peterkin's', 1886. Among other books are 'The Lord's Supper and its Observances', 1866, and a movel 'The Wolf at the Door', 1877.

HALE, SIR MATTHEW (1609-76), famous Eng. judge and chief justice; took no part in Civil War; justice of Common Pleas, 1653; chief baron of Exchequer, 1660; Chief Justice of England, 1671; wrote numerous works on law and history; many of his collected MSS. at Lincoln's Inn library.

HALE, NATHAN (1755-1776), American revolutionary soldier. *B.* in Coventry, Conn., June 6, 1755; *d.* in New York, Sept. 22, 1776. After graduating from Yale College in 1773, he taught school and intended to enter the ministry, but moved by patriotism he enlisted in 1775 and became a captain in 1776. After the retreat from Long Island he volunteered to penetrate the enemy's lines for information. Disguised as a Dutch schoolmaster he succeeded in his mission, but was caught by Howe who ordered his execution the next morning. His last words were 'I only regret that I have but one life to lose for my country'. See PARTRIDGE 'NATHAN HALE, THE IDEAL PATRIOT', 1902.

HALE, PHILIP (1854), Music and Dramatic Critic. *B.* in Vermont. Educated at Yale College. Admitted to the Bar in Albany, New York in 1879. From 1882-1884 at Berlin studied music under Haupt and Bargiel. Studied in Paris under Guilmant, 1885-1887. Organist in Troy and Albany ,New York. From 1889-1905 at Dr. de Normandie's Church, Boston. 1890-1891 was musical critic of Boston Post. 1891-1903 on Boston Journal. Since 1903 Boston Herald. Editor from 1897-1901 Musical Record, Boston. Boston Symphony Program Books.

HALE, WILLIAM GARDNER (1849), Amer. scholar; author of *The Anticipatory Subjunctive in Greek and Latin*, *The Sequence of Tenses in Latin*, etc.

HALEBID (13° 13′ N., 76° 2′ E.), village, state of Mysore, S. India; on site of Dorasamudra, ancient Hoysala capital.

HALES, JOHN (1584-1656); Eng. author; his political writings include *Declaration of the Succession of the Crowne Imperiall of Inglande*, *Discourse of the Common Weal*, etc.

HALES, STEPHEN (1677-1761), Eng. physiologist and inventor; curate of Teddington in Middlesex; made investigations in plant and animal physiology and on gases; on treatment of stone in bladder and kidneys; devised a ventilating machine, and a process for distilling sea-water.

HALESOWEN (52° 28′ N., 2° 3′ W.); market town, Worcestshire, England; large iron and steel works. Pop. 4,000.

HALEVI, JUDAH BEN SAMUEL (*d.* 1140), Span.-Hebrew poet; famed for religious poems.

HALEVY, JACQUES FRANÇOIS FROMENTAL ÉLIE (1799-1862), Fr. composer; real name, Levi; chief operas: *La Juive*, *Les Mousquetaires de la Reine*. Musical author.

HALÉVY, LUDOVIC (1834-1908), Fr. dramatist and novelist; chiefly associated with Henri Meilhac. They wrote the libretti for operas by Offenbach and Bizet (*La Belle Helene*, *La Grande Duchesse de Gerolstein*, *Carmen*, etc.), *Froufrou*, and other plays. His successful novels include *L'Abbe Constantin* and *La Famille Cardinal*.

HALF-TONE. See ENGRAVING.

HALIBURTON, THOMAS CHANDLER (1796-1865), an author, was *b.* in Nova Scotia. Called to the bar there, he eventually rose to be chief justice, to which high office he was appointed in 1828. He retired in 1856, when he came to England, where he resided until his

death. He was the author of many books, including histories of his native province; but it is for his writings under the pseudonym of 'Sam Slick' that he became best known. The three series of *The Clockmaker, or Sayings and Doings of Sam Slick of Slickville*, 1837-40, were reprinted in England and attracted much attention. His wit was racy, and the rigour of his outspokenness was only gilded by the humorous coating under which he disguised it. There is a memoir by F. Blake Crofton 1889.

HALIBUT, HIPPOGLOSSUS VULGARIS, large flat fish of predatory habits, found in N. hemisphere; distinguished by large mouth, right-sided eyes, and narrowness of body; length, 2-5½ ft.; female lays up to five million pelagic eggs.

HALICARNASSUS, modern Budrun (37° N., 27° 20′ E.), ancient Gk. city, Caria, Asia Minor, on Ceramic Gulf; site of the world-famous mausoleum, built 352 B.C.

HALIFAX, a city and cap. of Nova Scotia, Canada, situated on the E. coast on a fortified eminence on Chebucto Bay. The harbour is 6 m. long and 1 m. wide, and is open all through the year, having splendid anchorage. It has two entrances which are formed by McNab's Island, situated in the mouth, and in the N. it is connected by a narrow channel with Bedford Basin, which is deep enough for the largest vessels. Until 1905 this was the sole point in Canada with a garrison of British regular troops. It is the Atlantic terminus of the Intercolonial, Canadian Pacific, and other railways. The harbor is one of finest in the world; is well fortified; seat of Dalhousie Univ.; large sea trade, especially in fish, apples, lumber, and agricultural produce; large quantities of munitions exported during Great War. In Dec. 1917 a large area of the city was destroyed, and over 5,000 people killed and injured, as result of explosion following collision in Halifax harbor of Fr. steamship loaded with munitions and Norweg. relief ship; part of suburb Dartmouth, on opposite side of harbour, was laid in ruins. Pop. 1921, 70,203.

HALIFAX, GEORGE MONTAGUE DUNK, 2ND EARL OF (1716-71), Brit. administrator; president, Board of Trade 1748; lord-lieutenant of Ireland 1761; secretary of state in Bute's cabinet 1762, and in Grenville's 1763-5; secretary of state in Lord North's government at time of his death.

HALIFAX, GEORGE SAVILE, 1ST MARQUESS OF (1633-95), Eng. politician and author; opposed bill excluding James, Duke of York, from succession 1680; lord privy seal 1682. Under James II. became president of Council 1685, but shortly afterwards was dismissed from office; was one of the commissioners sent by James II. to arrange terms with William of Orange; held office as lord privy seal in early part of William's reign, but retired in 1690.

HALL, ARTHUR CRAWSHAY ALLISTON (1847), Bishop. *B.* in England. Educated at Christ Church, Oxford and Universities of Vermont and Columbia. Minister of Church of England; licensed preacher in Diocese of Oxford as member of Society of St. John the Evangelist. Assistant minister in 1874 of church of the Advent, Boston. From 1882-1891 minister at Mission Church of St. John the Evangelist. Was consecrated bishop in 1894. Author of *The Virgin Mother, Christ's Temptation and Ours, Charges on Liberty and Loyalty, A Companion to the Prayer Book, The Christian Doctrine of Prayer, Meditations on the Lord's Prayer.*

HALL, ASAPH (1829-1907), an American astronomer, *b.* in Goshen, Conn. He graduated from the University of Michigan and after serving as instructor in several colleges was made professor of mathematics in the United States Navy. He made several important astronomical discoveries including that of the two moons of Mars, which were named by him Dimos and Phobos.

HALL, BASIL (1788-1844), a British naval officer, *b.* at Edinburgh. He entered the navy in 1801, and was present at the battle of Corunna in 1809, on board the *Endymion*. In 1816 he went to China with Lord Amherst's embassy, and described the incidents of the commission and the explorations in the Eastern seas, etc., in his *Account of a Voyage of Discovery to the West Coast of Corea and the Great Loo-Choo Islands*, 1818. He also published *Philosophical Transactions*; *Extracts from a Journal written on the Coasts of Chili, Peru, and Mexico*; and *Fragments of Voyages and Travels*, which contains, besides the subject-matter of the title, some interesting accounts of the navy in the early part of the 19th Century. In 1842 H.'s mind gave way, and he ended his days in Haslar Hospital.

HALL, CHARLES CUTHBERT (1852-1908), American Presbyterian clergyman. *B.* in New York, Sept. 3, 1852; *d.* there March 25, 1908. Graduating from Williams College in 1872 and the Union Theological Seminary in 1873, he completed his studies in London and Edinburgh. Was pastor of the Presby-

terian Church at Newburgh, N. Y., 1875-1877; First Presbyterian Church, Brooklyn, N. Y., 1877-1897; elected president of the Union Theological Seminary, 1897. Among his publications are 'Does God Send Trouble', 1894; 'Gospel of the Divine Sacrifice', 1896; 'Christ and the Human Race', 1905, and 'Christ and the Soul', 1909.

HALL, CHARLES FRANCIS (1821-1871), Arctic explorer. *B.* in Rochester, New Hampshire, in 1821; *d.* in Thank God Harbor, Greenland, Nov. 8, 1871. He led two expeditions to trace the unfortunate Franklin expedition, 1860-1862 and 1864-1869 and from the natives of King Williams Land learned of the fate of 79 of the 105 members of Franklin's party. In 1871 he commanded the government ship Polaris in a north Pole expedition and reached 82° 11′ N. the highest northern latitude then attained. Publications 'Arctic Researches and Life Among the Exquimaux', 1864; 'Narrative of the 2nd Arctic Expedition', 1879. See DAVIS 'THE POLARIS NORTH POLE EXPEDITION'.

HALL, FLORENCE MARION HOWE (1845), Author. *B.* in Boston. Educated at private schools. Studied music with Otto Dresel, Boston. Was first chairman of correspondance of New Jersey of General Federation of Women's Clubs. Vice-president of department of education of New Jersey State Federation of Women's Clubs from 1911-1913. Regent continental Chapter of Daughters of American Revolution. Author of 'Social Customs', 1887; 'The Correct Thing', 1888, 1902, 'Flossy's Play-days', 1906; 'Social Usages at Washington,' 1906; 'Handbook of Hospitality in Town and Country', 1910; 'The A B C of Correct Speech', 1916. In 1913 edited the Julia Ward Howe and the Woman Suffrage Movement.

HALL, FREDERIC ALDIN (1854), University Chancellor. *B.* in Maine. Educated at Drury and Tufts Colleges and Universities of Washington and Missouri. 1878-1891 principal of Drury Academy. 1898-1901 dean of Drury College. At Springfield, Missouri, 1899-1901 director of Summer School. Chancellor of Washington University since 1917. Trustee of Drury College. From 1900-1910 director and superintendent St. Louis City Missionary Society. Member of Archaeological Institute of America, Phi Beta Kappa. Decorated in 1918, Order of the Redeemer. Author of 'Homeric Studies for young Readers'; 'Outline of the Odyssey'; 'Outline of the Orestrian Trilogy'; 'Iphigenia in Literature'.

HALL, GRANVILLE STANLEY (1846), University president. *B.* in Ashfield, Mass., Feb. 1, 1846. He graduated from Williams in 1867 (A.B. A.M.) Union Theological Seminary 1867-1868 and studied in Germany, 1871-1872. Was professor of psychology Antioch College, 1872-1876; instructor in English, Harvard, 1876-1877; professor of psychology Johns Hopkins, 1881-1888; president and professor of psychology Clark University 1888-1920. He founded and edited the American Journal of Psychology 1887-1921. Fellow of the American Academy of Arts and Sciences, etc. Publications include 'Adolescence', 1904; 'Educational Problems', 1911; 'The Foundations of Modern Psychology', 1912; 'Supreme Standard of Life and Conduct', 1920; 'Recreations of a Psychologist', 1920.

HALL, JAMES NORMAN (1887), Author. *B.* in Colfax, Iowa. Bachelor of Philosophy of Grinnell College. Author of 'Kitchener's Mob', 1916; 'High Adventure', 1918; 'Faery Lands of the South Seas', (with C. Nordhoff), 1921.

HALL, JOHN LESSLIE (1856), College Dean. *B.* in Richmond, Va. Educated in Randolph-Macon College. Doctor of Philosophy of Johns Hopkins University, 1892. In 1921 Doctor of Laws of William and Mary College. 1888-1907 professor of English and History, English literature and languages since 1907 and dean of faculty of William and Mary College. Author of 'Translation of Beowulf', 1892; 'Old English Idyls', 1899; Judith, Phoenix and Other Anglo-Saxon Poems', 1902; 'English Usage', 1917; Joint editor of Baskerville, Harrison and Hall's Anglo-Saxon Reader, 1900; 'Half-Hours in Southern History'.

HALL, LYMAN (1725-1790), A signer of the Declaration of Independence. *B.* in Connecticut in 1725. Graduating from Yale College in 1747 he later moved to St. John's parish, Georgia. Many people from New England had settled there who were active in persuading Georgia to cast in her lot with the Colonies. In 1775 Hall was sent as delegate to the Congress and was allowed to debate, but not to vote, as he was Georgia's only representative. Later he was one of the five delegates to Congress elected by the State. He was re-elected 1776 and 1780, and was governor of Georgia 1783-1785.

HALL, PERCIVAL (1872), College President. *B.* in Georgetown, District of Columbia. Bachelor of Arts, Harvard College, 1892; Master of Arts, Gallaudet

College, 1893; Doctor of Literature, Washington University, 1914. From 1893-1895 instructor at School for the Deaf, Washington Heights, New York; instructor and professor of mathematics, 1895-1910 and since 1910 president of Gallaudet College; president board of directors Columbia Institute for the Deaf; president of Convention of American Instructors of the Deaf.

HALL, THOMAS CUMING (1858), Theologian. *B.* in Ireland. Bachelor of Arts, Princeton College in 1879 and in 1882 graduated from Union Theological Seminary. Doctor of Divinity of Marburg, 1921. In 1883 ordained Presbyterian Minister; 1883-1886 pastor in Omaha. At 41st Street Church from 1886-1893. At the Fourth Church 1893-1897 in Chicago. At Union Theological Seminary, 1898-1917 professor of Christian Ethics. 1921-1923 professor of philosophy, faculty of University of Göttingen. Author of 'The Power of an Endless Life', 1893; 'The Social Significance of the Evangelical Revival in England', 1899; 'The Synoptic Gospels', 1900; 'Social Solutions in the Light of Christian Ethics', 1910.

HALLAM, ARTHUR HENRY (1811-33), Eng. poet, elder *s.* of Henry Hallam, the historian; his sudden death at Vienna inspired Tennyson's poem *In Memoriam*; literary *Remains*, ed. by his *f.* pub. in 1834.

HALLAM, HENRY (1777-1859), Eng. historian; careful investigator; produced work incisive, judicious, and accurate; chief works include *View of the State of Europe during the Middle Ages*, 1818; *Constitutional History of England from Accession of Henry VII. to Death of George II.* 1827; *Introduction to the Literature of Europe in the Fifteenth, Sixteenth, and Seventeenth Centuries*, 1838-39, etc.

HALLE-AN-DER-SAALE (52° 5′ N., 8° 22′ E.), town, Prussian Saxony, Germany; cathedral and famous university, founded 1694, 2500 students; salt-works. Pop. 1919, 182,326.

HALLECK, FITZ-GREENE (1790-1867), American poet and writer. *B.* in Guildford, Conn., July 8, 1790; *d.* there Nov. 19, 1867. At the age of 18 he was employed by a bank and continued there for 20 years. John Jacob Astor engaged him as confidential agent and also appointed him one of the first trustees of the Astor Library. In 1849 Mr. Halleck retired to his native town. From early youth he had written prose and verse. With Joseph Rodman Drake he wrote 'The Croaker Papers' for the N. Y. Post in 1819; 'Fancy' a satire, is his longest poem. He is best remembered to-day by the stirring martial poem 'Marco Bozzaris'. His 'Complete Poems', in one volume were published. See WELLS' 'LIFE AND LETTER OF FITZ-GREENE-HALLECK'.

HALLECK, HENRY WAGER (1815-1872), American soldier. *B.* in Westernville, N. Y., Jan. 16, 1815; *d.* Louisville, Ky., Jan. 9, 1872. Graduating from the U. S. Military Academy in 1839, he engaged in engineering work in Washington and New York. Secretary of State, California, 1847-1849; Inspector of lighthouses 1852-1854 and then resigned for law practice in San Francisco. Was president of the Pacific and Atlantic R. R., 1850-1861. In 1861 during the Civil War he was in command of the Department of Missouri; directed the western campaign of 1862, and captured Corinth, and in July of that year was made general-in-chief of U. S. armies until superseded by Grant in March, 1864, Chief-of-Staff to 1865; commanded the military division of the James, 1865, of the Pacific, 1865-1869, and of the South until death. Author of 'Elements of Military Art and Science', 1864; 'Bitumen' and 'International Law', 1861.

HALLELUJAH, ALLELUIA (Heb. 'Praise the Lord'), exclamation of religious praise or exaltation; *Psalms* 113-118, called H., in R.C. Church, as song of gladness, not used throughout Lent.

HALLER, ALBRECHT VON (1708-77), Swiss anatomist, physiologist, pathologist, botanist, and poet; after wide course of study he practised as physician at Bern, and became prof. of Medicine, Anatomy, Bot., and Surgery at Göttingen 1736; establishing a botanic garden, anatomical museum, school of obstetrics, etc.; retured to Bern as a magistrate; his most valuable researches are in physiology and bot., and he took a prominent part in the literary movement of the time, writing three political romances and descriptive lyrical and other poems.

HALLETT, RICHARD MATTHEWS (1887), Author. *B.* at Bath, Maine. At Harvard College, 1907; Bachelor of Arts 1910; Bachelor of Laws. Author of 'The Lady Aft', 1915; 'Trial by Fire', 1916; (Serials) 'The House of Craigenude', 'Ticklish Waters' and in 1921 'The Canyon of the Fools'. Writes for the Saturday Evening Post.

HALLEY, EDMUND (1656-1742), Eng. astronomer; ed. Queen's Coll., Oxford; stayed at St. Helena, 1676-78; made catalogue of stars of S. hemisphere and arranged them in constellations; discovered 1682 comet which bears his name, and correctly predicted its return in 1759; made astronomer-royal, 1719.

HALLEY, JOSEPH ROSWELL (1826-1905), an American statesman, *b.* in Stewartsville, N. C. He studied law and entering politics became prominent as an orator and speaker. He served throughout the Civil War receiving the rank of major general. He was governor of Connecticut in 1866 and was president of the Republican National Convention of 1868. He served in Congress from 1872 to 1876 and was president of the United States Centennial Commission, from 1873 to 1876. He was elected to the Senate in 1881, serving until 1905.

HALLEY'S COMET. See COMET.

HALLIWELL-PHILLIPS, JAMES ORCHARD (1820-89), Eng. scholar; his works include an edit. of Shakespeare, 1853-65; *Life of S.* 1848; *Dictionary of Old English Plays*, 1860, etc.

HALL-MARKS, the marks placed on gold or silver articles to indicate the quality of the gold or silver; *e.g.*, in the case of gold, a crown and the number 22 indicate that the article is of 22 carat gold (*i.e.*, contains 22 parts of gold out of 24). On silver ware the marks indicate respectively that the articles are of 11 oz. 10 dwt. and 11 oz. 2 dwt. fineness, showing the proportion of pure silver in 1 lb. (= 12 oz.) of the metals thus marked. Hall-marks on silver plate were introduced in the 13th cent. by the Eng. Guild of Goldsmiths and Silversmiths; these were the king's mark, the maker's mark, and the year's mark. Some provincial towns have their own assay marks. The lion *passant* was introduced in 1554; from 1784 to 1890 the sovereign's portrait was used.

HALL OF FAME, a building on University Heights, New York City, on the grounds of the New York University. It was erected from a gift of $100,000, afterwards increased to $250,000 for a building to be called 'The Hall of Fame for Great Americans'. On the ground floor of the buildings is a museum, 200 feet long by 40 feet wide, consisting of a corridor and six halls to contain mementos of the names inscribed above. The collonade is 600 feet, with provision for 150 panels, each to bear the name of a famous American. Only those persons who shall have been dead 25 years or more are eligible to be chosen. The names are selected by a committee composed of prominent persons. The Hall was dedicated on May 30, 1901, when 25 national associations each unveiled one of the brass tablets in the collonade. On May 30, 1907 eleven new tablets were unveiled. Up to 1923 the names of 56 men and 7 women had been inscribed on the tablets. In May, 1923 the busts of Edgar Allen Poe, George Washington, General Grant, Miss Maria Mitchell and Mark Hopkins were unveiled.

HALLOWE'EN (Oct. 31), the Eve of All Saints' Day; usually devoted to merry-making and divination.

HALLUCINATION, term applied to a false appreciation of sense impressions, the individual believing that a sense-organ has received an impression from some object which has in reality no physical existence. The hallucination may involve any of the senses, but most commonly it is auditory or visual, due to the more striking character of such impressions and to the more constant use of the ears and eyes; it may, in rare cases, involve two senses. Hallucinations may be experienced by certain individuals under conditions of quite normal health and sanity, to which no precise cause can be assigned; they may be experienced under conditions differing but slightly from the normal, as when one or other of the senses has been subjected to a strain, or when the body has been in want of food for a considerable period, or when an individual is under the influence of certain drugs (opium or Indian hemp) or in the transitional state between sleep and waking, or in a state of hypnosis, or under conditions of intense emotional excitement; they may be experienced when the body or mind is in a diseased condition, as in diseases of the heart, lungs, or abdominal organs, or in delirium tremens, hysteria, or epilepsy, as well as in conditions of more advanced mental disease, melancholia, mania, monomania, and other forms of insanity. The condition precedent of all forms of hallucination is partial or total dissociation of consciousness.

The physiological explanation of hallucination is that in the cerebral cortex certain centres normally work in association with others, all being capable of stimulation by sensory stimuli. If some of the association-paths between centres are blocked, as in fatigue, disease, etc., the excitements in one centre will radiate into unusual paths, and so excite centres not usually excited from these paths. The perception thus aroused, however, will naturally be referred to the ordinary sensory stimulus, and the result is a hallucination. There is a disturbance of the normal relation between the central and the peripheral nervous elements.

HALLUIN (50° 47′ N., 3° 8′ W.); fortified town, Nord, France; textiles. Pop. 16,600.

HALMAHERA (1° N., 128° E.); island of the Dutch East Indies, E. of Celebes; area, *c.* 6800 sq. miles; consists

of four peninsulas, each traversed by a mountain chain from 3000 to 4000 ft. high, with several active volcanoes. Chief town, Gilolo. Pop. *c.* 100,000.

HALMSTAD (56° 39′ N., 12° 49′ E.), seaport, Sweden, on Cattegat; breweries, cloth manufactures; exports granite. Pop. 1921, 18,409.

HALO, a luminous circle around sun or moon, caused by refraction of light passing through ice-crystals suspended in the atmosphere; true h's are large circles of definite diameters, 45° and 92°, which are seldom both seen together; usually whitish, but occasionally exhibit prismatic colours, red being on inside; smaller coloured circles sometimes seen round the moon are due to diffraction of light by cloud or mist.

HALO, originally a circular metal plate to preserve heads of statues; adopted by Christian artists as symbol of holiness; may be cruciform, square, or stellate, but generally takes form of circle or ring; found also in early Oriental paganism.

HALOGENS are Fluorine, Chlorine, Bromine, and Iodine. Each forms monobasic gaseous acid.

HALPINE, CHARLES GRAHAM (MILES O'REILLY) (1829-1868), American journalist and poet. *B.* in Oldcastle, County Meath, Ireland, Nov. 20, 1829; *d.* in New York, Aug. 3, 1868. After studying at Trinity College, Dublin, he came to Boston in 1851 and was assistant-editor of the Boston Post. With B. P. Shillaber (Mrs. Partington), he started a comic weekly 'The Carpet Bag' which failed. As Washington correspondent of the N. Y. Times his letters attracted attention, and he joined the staff of the N. Y. Herald. In the Civil War he enlisted in the 69th N. Y. Volunteers, became assistant adjutant-general under Hunter and a Colonel with Halleck, resigning in 1864, brevetted brigadier-general. Was noted for his humorous verse. Publications 'Life and Adventures, Songs, Services, and Speeches', 1864; 'Poetic Works', 1865.

HALS, FRANS (*c.* 1580-1666), Dutch artist; famed for portraits and genre subjects, in the latter of which he is one of the greatest of Dutch masters. He was particularly successful in dealing with scenes of carousal, depicting laughter, etc. (e.g. *The Laughing Cavalier*). Fine examples of his work are in the galleries of Amsterdam and Haarlem. He was notorious for his drunken and disorderly life. His *b.*, Dirk H., and his *s.*, Frans H., the Younger, were also artists of distinction.

HALSBURY, HARDINGE STANLEY GIFFARD, 1ST EARL OF (1825-1921), Brit. Conservative statesman; Lord Chancellor, 1895-1905; M.P. for Launceston, 1877-85; Solicitor-Gen. 1875-80; cr. Baron H., 1885; Earl, 1898; formerly held large criminal practice; was engaged in Tichborne trial; gave judgment in House of Lords 1904 in the appeal of Scot. Free Church against the Scot. U F. Church; led extreme 'Die-Hard' party in Lords against Parliament Bill.

HALSEY, FRANCIS WHITING (1851-1919), Author and editor. *B.* in Unadilla, N. Y., Oct. 15, 1851; *d.* in New York, Nov. 20, 1919. Graduating from Cornell in 1873 he engaged in journalism, first with N. Y. Tribune, 1875-1880, then the N. Y. Times, 1880-1902, editing the Times Saturday Review from its first number in 1896 to 1902. He was literary adviser for D. Appleton, 1902-1905, and for Funk and Wagnalls, 1905-1919. Author of 'The Old Northern Frontier', 1901; 'Our Literary Deluge', 1902. Editor 'American Authors and Their Homes', 'Authors of Our Day in Their Homes', 1902; 'Women Authors of Our Day in Their Homes'; 'The World's Famous Orations' (with W. J. Bryan), 1906; 'Great Epochs in American History', 1912; 'Seeing Europe with Famous American Authors', 1914, etc.

HALSTEAD, MURAT (1829-1908), American journalist. *B.* in Ross, Butler co., Ohio, Sept. 29, 1829; *d.* in Cincinnati, July 2, 1908. He studied at Farmers College near Cincinnati and began to write for newspapers at 18. In 1854 he bought an interest in the Commercial, of Cincinnati, which was afterwards combined with its rival The Gazette as The Commercial-Gazette and became the organ of the Republican Party in Ohio. In 1890 Mr. Halstead moved to Brooklyn, New York and edited The Standard-Union. During the Spanish War he was special correspondent in the Philippines. Author of 'The Story of Cuba', 'Life of William McKinley', 'Story of the Philippines', 'The History of American Expansion', 'The Boer and British War', 'War between Russia and Japan', etc.

HAM, one of the sons of Noah (*Genesis*); founder of the Hamitic race, including the Ethiopians, Egyptians, and others.

HAM. See MEAT PRODUCTS.

HAMADAN (34° 55′ N., 48° 20′ E.); town, Persia, near foot of Mt. Elvend; important entrepôt of trade; extensive manufactures of leather; contains tomb of Avicenna, and another, said to be

that of Mordecai and Esther; occupies site of ancient *Ecbatana*. Pop. *c.* 40,000.

HAMAH, OR HAMATH, famous Hittite city, referred to in Bible, situated on the Orontes, about 100 miles from Damascus; conquered by the Assyrians, VIII. cent. B.C.

HAMBURG, free city and state, Germany (53° 33′ N., 10° E.), on N. branch of Elbe; second largest city of Ger. Empire; greatest seaport and commercial town on Continent. The old town is intersected by canals (Fleete), and is surrounded by fine shaded promenades. To N. lie two wide sheets of water, the Binnen- and Aussen-Alster separated by Lombard's Brücke; fashionable quarter surrounds Binnen-Alster. Docks on both sides of river cover huge area; part of harbor in a free port. Hamburg trades chiefly with Britain and America, also with Scandinavian, Russian, S. Amer., Eastern, and other ports; chief imports are sugar, tea, coffee, chocolate, lard, rice, wine, herrings, skins, leather, wax, hemp, tobacco, jute, indigo, oils, rubber, coal; chief industries are food-stuffs, breweries, shipbuilding, machinery, chemicals, furniture, musical and scientific instruments, and factories where above imports are treated. Little of mediaeval Hamburg survives owing to great fire 1842. Among the chief buildings are St. Peter's, St. Nicholas's, and St. Michael's churches, Rathaus, Kunst-halle, museums, etc. Hamburg has important schools of navigation and commerce, and before Great War had a world-famous zoological garden. Hamburg was founded by Charlemagne 808; in mid-13th cent. formed Hanseatic League with Lübeck and Bremen; made free imperial city 1510; joined Deutscher Bund 1815; Nord-Deutscher Bund 1866; Ger. Empire 1871; and Zollverein 1888; great cholera plague 1892. During World War Hamburg suffered greatly, its shipping trade, on which it depended largely for prosperity, being destroyed. In early days of revolution of 1918 the city was the scene of a good deal of rioting, and two warships in harbor were blown up. Hamburg state (area, 160 sq. m.) is a republic governed by senate and house of burgesses, and after revolution of 1918 constitution was made more democratic. Pop. (city), 985,779; (state), 1,050,359.

HAMBOURG, MARK (1879), Russian pianist and composer; *b.* Bogutchar, South Russia. He studied music under Leschetitzky at Vienna, where he obtained the Liszt scholarship in 1894. His concert debut was made at Moscow in 1888 and was followed by a successful tour of the leading European capitals. He also toured America, 1899-1900, 1902-03, 1907; South Africa, 1905-1907 and made his first Canadian tour in 1910. He has become a naturalized British subject. His publications include *Variations On a Theme by Paganini*, *Volkslied*, *Impromptu Minuet* and *How To Become a Pianist*, 1922.

HAMBY, WILLIAM HENRY (1875), Writer. *B.* at Wright County, Missouri. Educated at Drury College and University of Missouri. From 1895-1905 was owner at, Boulder, Colorado; Meadville, Missouri; Marceline, Missouri of newspapers. Writes special articles and fiction for various magazines including McClure's, Century and Saturday Evening Post. Author of 'Tom Henry of Wahoo County', 1911; 'Getting and Holding', 1910; 'The Sound of the Hammer', 1914; 'If a Man Fails Seven Times', 1917; 'The Way of Success', 1918; 'The Desert Fiddler', 1919; 'Crooked Water', 1921; 'Vagabond's End', 1921.

HAMELIN, FRANÇOIS ALPHONSE (1796-1864), Fr. admiral and naval administrator; was engaged in bombardment of Sebastopol 1854; as Minister of Marine was responsible for construction of the first ironclad, *Gloire*, launched 1859.

HAMELN (52° 7′ N.; 9° 21′ E.), town, Hanover, Prussia; formerly fortified; many quaint buildings associated with legend of the Pied Piper; iron- and paper-works. Pop. 22,000.

HAMERTON, PHILIP GILBERT (1834-94), Eng. artist and author; wrote *Etching and Etchers*, *The Intellectual Life*, and numerous other works of art criticism.

HAMILCAR BARCA (*d.* 228 B.C.), Carthaginian general; maintained Carthaginian rule against Romans in Sicily, 247-241; opposed Romans in Spain, *c.* 236-228; great military genius; *f.* of Hannibal.

HAMILTON, a city of Ontario, Canada, in Wentworth co., of which it is the capital. It is on the Grand Trunk, the Canadian Pacific, and the Toronto, Hamilton and Buffalo railroads, and on Burlington Bay. It has an excellent harbor and the city is an important commercial center and has steamship connection with lake ports. It is the center of an important fruit growing region of western Ontario. Excellent water power is furnished by the Decew Falls, 35 miles southeast of the city. Natural gas is supplied from the Welland field. Hamilton has over 500 manufacturing establishments which include a great variety of industries. Pop. about 110,000.

HAMILTON, a city of Ohio, in Butler co., of which it is the county seat. It is on the Pittsburgh, Cincinnati, Chicago and St. Louis, the Cincinnati, Hamilton and Dayton, and the Ohio Electric railroads, and on both sides of the Great Miami River and on the Miami and Erie Canal. Abundant water power is supplied by the river for the extensive industries which include the manufacture of railroad supplies, machinery, boots and shoes, flour, bank vaults, wool, cotton and lumber. The public institutions include Notre Dame Academy, the Hamilton Children's Home, the Mercy Hospital, and a court house. Pop. 1920, 39,675.

HAMILTON (55° 47′ N., 4° 3′ W.), town, on Clyde, Lanarkshire, Scotland; near it is Hamilton Palace, a seat of the Duke of Hamilton; in neighbourhood are remains of ancient castle of Cadzow; chief industry, coal and iron mining. Pop. 1921, 39,420. (37° 45′ S., 142° 1′ E.), town, Victoria, Australia; has fine racecourse; is centre of agricultural and pastoral district. Pop. 5,000.

HAMILTON, chief town, on Hamilton I., Bermudas, W. Indies (32° 16′ N., 64° 55′ W.), safe harbor; Brit. garrison. Pop. 2,600.

HAMILTON COLLEGE, educational institution located at Clinton, N. Y. It was founded by a Congregational missionary, Samuel Kirkland, in 1793, but owing to lack of funds the building itself was not opened until 1798. Designed at first as an academy for both white and Indian children, the institution gradually expanded its curriculum and facilities until in 1812 it was chartered by the State as Hamilton College, in honor of Alexander Hamilton, who had contributed to its funds and assisted in its growth. It offers two courses of study: the Classical and the Latin-Scientific. It has fine laboratories, thorough equipment and a library of over 70,000 volumes. In 1923 it had an enrollment of 324 students and there were 31 members in the Faculty.

HAMILTON (53° N., 60° W.), river, Labrador, Canada; flows into the Atlantic through Hamilton inlet.

HAMILTON, Scot. family, descended from Walter Fitz-Gilbert, a supporter of Bruce who was granted barony of Cadzow in return for his services; his *s.* David was captured at Neville's Cross, 1346, and was founder of chantry in Glasgow Cathedral, 1361. In 1445 Sir James H. of Cadzow became Lord H., and in 1503 his *s.* James was cr. Earl of Arran. The second Earl of Arran was tutor to Mary, Queen of Scots, for whom his eldest *s.* James was proposed as husband. James afterwards lost his reason, and his *b.* John, as head of family, became 1st Marquess of H. in 1599; he was accused of share in murder of Regents Lennox and Murray.

James, 1st Duke of Hamilton 1606-49, 3rd marquess, obtained dukedom in 1643; served under Gustavus Adolphus, 1631; took part in disputes between Charles I. and Covenanters, and went to Scotland with the king in 1641; for a short time he deserted the Royalist cause and threw in his lot with Argyll, but was subsequently restored to favour. In 1648 he commanded Scots army in England in support of king, but was defeated and captured at Preston, and executed in the following year. William, 2nd Duke 1616-51, Royalist in Civil War, was mortally wounded at Worcester. James, 4th Duke 1658-1712, opposed Union of Parliaments. James, 6th Duke, m. Elizabeth Gunning. Present Duke 13th succ. 1895. Dukes of Abercorn are cadet branch of H. family, and Earls of Haddington also came from Walter FitzGilbert.

HAMILTON, ALEXANDER (1757-1804), American statesman. *B.* in Charles Town, Nevis Island, West Indies, Jan. 11, 1757; *d.* in New York, July 12, 1804. He was a natural *s.* of James Hamilton and Rachel Levine, a woman of French extraction separated from her husband. After his mother's death her relatives cared for him and sent him to the United States to be educated. Graduating from King's College now Columbia in 1773, he became noted for his brilliant advocacy of the cause of the Colonists. Captain of the first Continental Artillery Company he fought in the battles of Long Island, White Plains, Trenton, and Princeton, and in 1777 was Lt. Colonel and aid-de-camp on Washington's staff. In 1780 he married Elizabeth Schuyler, *d.* of General Schuyler of New York. At the siege of Yorktown he headed a storming party that captured an important British redoubt. After the war he practiced law; was a member of the Continental Congress 1782-1783, the Annapolis Convention of 1776 and Constitutional Convention of 1787. A member of Congress 1787-1788 he was the first U. S. Secretary of the Treasury 1789-1795. After parties were formed he led the Federalists being opposed by Jefferson, the Republican leader. When a French war was threatened in 1899-1800, John Adams through deference to Washington made Hamilton the actual head of the army. The Federals were defeated in 1800 through the publication of an anti-Adams pamphlet written by Ham-

ilton. When Burr and Jefferson were nominated, Hamilton forgot his differences with the latter and worked for his success. Burr never forgot this, and found a pretext to call Hamilton out. They fought a duel at Weehawken, July 11, 1804 when Hamilton was mortally wounded and *d.* July 12, 1804. He was brilliant in framing constructive measures of government and his services to the young nation cannot be overestimated.

HAMILTON, CLAYTON (MEEKER) (1881), Author, lecturer, editor. *B.* in Brooklyn, N. Y. Bachelor of Arts of Polytechnic Institute of Brooklyn, 1900. 1901-1904 at Barnard and Columbia College tutor in English. Since 1903 extension lecturer at Columbia. At Classical School for Girls, 1900-1920 lecturer. 1903-1906 at New York Department of Education. At Brooklyn Institute Arts and Sciences 1913-1919; dramatic critic and associate editor from 1907-1909 of the Forum, The Bookman, 1910-1918 Vogue, 1912-1920. Author of 'The Stranger at the Inn', 1913; play and other Books, 'Materials and Methods of Fiction', 1908; 'Studies in Stagecraft', 1914; 'Seen on the Stage', 1920. From 1920-1922 associate editor at Goldwyn Studios.

HAMILTON, EMMA, LADY (*c.* 1765-1815), was the humbly born and beautiful wife of Sir William H., ambassador at Naples; principally remembered as mistress of Nelson; subject of many pictures by Romney; *d.* in poverty at Calais.

HAMILTON, GAIL pseudonym of Mary Abigail Dodge *c.* 1830-96, Amer. author; wrote *Woman's Wrongs* 1868, etc.

HAMILTON, SIR IAN STANDISH MONTEITH (1853), Brit. general; entered army 1873; fought under Roberts in Afghanistan 1878-80; with Low in Chitral relief expedition 1895; commanded 3rd Brigade in Tirah War 1897-8. On outbreak of S. African War appointed chief of staff of the Natal relief force under Sir G. White; commanded at Elandslaagte (Oct. 21, 1899); through siege of Ladysmith; subsequently commanded mounted infantry division; chief of staff to Kitchener 1901, and again commanded mobile columns in W. Transvaal. Quartermaster-general of army 1903-4. At outbreak of World War appointed to commnad 4th Army, which he was organizing when sent to take charge of land forces at the Dardanelles. He was relieved of his command in Oct., 1915. He pub. *A Jaunt in a Junk*, 1884; *Fighting of the Future*, 1885; *Icarus*, 1886; *A Ballad of Hadji*, 1887; and in 1920 issued his *Gallipoli Diary* (2 vols.),

HAMILTON, LORD GEORGE FRANCIS (1845), Brit. statesman; M.P. 1868-1906; under-secretary of state for India 1874-8; vice-president of Council 1878-80; first lord of the Admiralty 1885-92; chairman of London School Board 1894-95; secretary of state for India 1895-1903; chairman of commission of Poor Law and Unemployment 1905-9; chairman Mesopotamia Commission 1916-17.

HAMILTON, SIR WILLIAM (1730-1803), Brit. diplomatist and antiquarian; envoy at Naples; his wife became the mistress of Lord Nelson.

HAMILTON, SIR WILLIAM, BART. (1788-1856), Scot. philosopher; ed. Balliol Coll., Oxford; app. prof. of Civil History at Edinburgh, 1821, and of Logic and Metaphysics, 1836; pub. *Philosophy of the Unconditioned*, 1829; edit. Reid's works, 1846, and *Discussions in Philosophy, Lit., and Education*, 1852-53.

HAMIRPUR (25° 58′ N., 80° 11′ E.); town, capital of H. district, Allahabad, Brit. India; at junction of Betwa and Jumna; cotton and grain. Pop. 7,000.

HAMITIC LANGUAGES AND PEOPLES.—Hamitic Languages are agglutinative or inflectional, and are generally grouped as the Ancient Egyptian, N. African, and Ethiopian or Cushite languages; of these the first are still represented by liturgy of Coptic Church, second by modern Berber dialects, and third by tongues spoken in Abyssinia and elsewhere.—Hamitic Peoples are generally classed as belonging to Caucasian family; include Berbers of N. Africa, Ethiopians, Egyptians, and other races. They are generally dark in complexion and of fine physique.

HAMLET, the hero of one of Shakespear's greatest tragedies which is founded upon a legend in the *Historia Danica* of Saxo Grammaticus (13th century). Shakespeare, however, owed little but the outline of his plot to Saxo, whose hero, Amleth, only feigned his madness and plotted a deliberate vengeance a year before carrying it out.

HAMLIN, ALFRED DWIGHT FOSTER (1855), American architect; *b.* Constantinople, Turkey. He was the *s.* of Cyrus Hamlin (*q.v.*). He graduated at Amherst College in 1875, and later pursued architectural studies at the Massachusetts Institute of Technology and at the Ecole des Beauxs-Arts, Paris. He joined the teaching staff of Columbia

University in 1883 as special instructor and later became professor of history and architecture in that institution. He has written extensively for periodicals. His publications include a *History of Architecture*, 1896; *European and Japanese Gardens, in collaboration*, 1902; *Cyrus Hamlin, Missionary*, 1903; and *History of Ornament, Ancient and Mediaeval*, 1916.

HAMLIN, CHARLES SUMMER (1861), Member of Federal Reserve Board. *B.* in Boston; educated at Harvard and Washington and Lee Universities. Practised at Boston as lawyer from 1886-1893 and 1898-1913. 1893-1897 assistant secretary of the United States Treasury and again from 1913-1914. 1914-1916 member of Federal Reserve Board of Washington. For term of 1916-1926 reappointed. In 1887-1888 defeated for Massachusetts senate. Ran for secretary of State in 1892, but defeated. Defeated for Democratic nomination for governor in 1902-1910. In 1897 Special Commissioner to Japan from United States. At Harvard College, 1902, 1903 lectured on United States Government. Author of 'Index Digest of Interstate Commerce Laws', 1907; 'Index Digest of Federal Reserve Act', 'Indes Digest of the Federal Reserve Bulletin', 1921.

HAMLIN, CYRUS (1811-1900), American missionary and educator; *b.* Waterford, Maine. He graduated at Bowdoin College in 1834 and at the Bangor Theological Seminary three years later. He chose the foreign field, and from 1837 to 1859 was a missionary to Turkey. In 1860 he became president of Robert College in Constantinople, one of the most notable educational institutions in the Near East. In 1877 he returned to this country and became a professor in Bangor Theological Seminary. Later he was president of Middlebury College, Vermont 1880-85. He was an expert in the Turkish and cognate tongues, and some of his writings were in the Armenian language. His publications in English include *Among the Turks*, 1887; and *My Life and Times*, 1893.

HAMLIN, HANNIBAL (1909-1891), an American statesman, *b.* near Paris Hill, Me. Studying law, he began to practice in Hampden, Me., in 1833, was several times elected to the state legislature, then, in 1842, was elected to Congress on a Democratic ticket. He entered the U. S. Senate in 1848 and served continuously till 1856, when he resigned to become governor of Maine, but a month later resigned as Governor to return to the U. S. Senate. On account of his Unionist sympathies he turned Republican at the outbreak of the Civil War and was elected Vice-President of the United States on the same ticket with Lincoln. During 1881-83 he was U. S. Minister to Spain.

HAMLINE UNIVERSITY, coeducational institution located at Hamline, Minn. It was originally established at Redwing, Minn., but was closed in 1869, an interval of eleven years elapsing before teaching was resumed at its present location. It has a course of study leading to the usual college degrees, a library of 15,000 volumes and an endowment fund of $1,100,000. In 1923 it had 556 students and 38 teachers.

HAMM (51° 40′ N., 7° 50′ E.), town; Westphalia, Prussia, on Lippe; iron foundries, wire-works; thermal baths; ancient capital of Mark. Pop. 45,000.

HAMMER, tool consisting of a steel head, fixed generally on a wooden shaft, and used for striking purposes. The powerful 'steam-hammer,' now largely used in engineering works, was invented by James Nasmyth, about 1840.

HAMMERFEST, seaport town, Norway (70° 40′ N. 23° 45′ E.) on island of Klavö; the most northerly town in Europe; mean ann. temp. 36° F.; exports fish, fish oil, hides, and down. Pop. 2,300.

HAMMERSMITH (51° 29′ N., 0° 14′ W.), borough, Middlesex, England; on N. side of Thames, forming part of W. London. Pop. 1921, 130,287.

HAMMERSTEIN, OSCAR (1847-1919), an American theatrical and political manager, *b.* in Berlin, in 1847. In 1863 he came to the United States, where he engaged in the business of making cigars, and through several labor-saving devices accumulated a large fortune. He then engaged in many theatrical and operatic enterprises. After managing several theatres in New York, he built the Harlem Opera House, and afterwards the Manhattan Opera House, a large edifice to compete with the Metropolitan Opera House. He also built opera houses in Philadelphia and in Boston. He conducted several brilliant seasons of opera in New York, but on account of financial difficulties was obliged to make an agreement with the Metropolitan Opera Company to produce no more opera for ten years. Under his auspices appeared several of the most famous operatic stars, including Mary Garden. His ventures in Philadelphia and London were financial failures. He wrote several short comedies and operettas.

HAMMOND, a city of Indiana, in Lake co. It is on the Pennsylvania

Company, the Chesapeake and Ohio, the Pere Marquette and other railroads, and on the Grand Calumet River. It is an important industrial community and has railroad supply shops, foundries, tanneries, chemical works, packing houses, etc. Its public buildings include a high school. Pop. 1920, 36,004.

HAMMOND, JOHN HAYS (1855), mining engineer. *B.* in San Francisco, March 31, 1855. Educated at public and private schools;the Sheffield Scientific School 1876, and the Royal School of Mine Freiburg, Saxony. Geologist with the U. S. Geological Survey of the California gold fields in 1880. Consulting engineer of Union Iron Works, San Francisco, and of the Central and Southern Pacific railways. His mining experiences have been world-wide. In 1893 he was chief mining engineer for the Barnato Brothers and then for Cecil Rhodes; consulting engineer of Consolidated Gold Fields Co., South Africa, the British S. A. Co., and the Rand, Fontein Gold Mining Co. He was one of the four reform leaders in the Transvaal in 1895-1896. Though not in sympathy with the Jameson Raid he was arrested and condemned to death, the sentence being commuted to fifteen years imprissonment. He was finally released on paying a fine of $125,000. Returning to America in 1900 he was associated with great mining enterprises in the United States and Mexico. President Taft appointed him special ambassador to represent the United States at the coronation of George V. President of the Panama-Pacific Exposition Commission to Europe in 1912. Chairman of the Worlds Court Congress, 1914-1915; President of the National League of Republican Clubs; Chairman of the Federal Coal Commission, 1923.

HAMMOND, JOHN HAYS, JR. (1888), Inventor. *B.* in San Francisco, Cal. In 1910 at Sheffield Scientific School (Yale) Bachelor of Science; inventor of type of torpedo for coast defense, controlled by wireless energy from coast fortifications. This invention was recommended to congress by Board of Ordnance and Fortifications for purchase by United States. Invented incendiary projectiles used by allied armies in World War. Inventor of system of automobile torpedo firing type in latest battleships of United States. Approved by the United States Navy and Signal Corps, United States, a system of selective radio telegraphy. On Bartlett Expedition for Polar exploration his system of aerial coast surveying was used. Member of advisory Committee of Langley Aerodynamic Laboratory of Smithsonian Institute; fellow of American Geographic Society; was director of American Society of Aeronautic Engineers; honorary member of National Institute of Inventors.

HAMMOND, WILLIAM ALEXANDER (1828-1900), American surgeon; *b.* Annapolis, Md. He graduated at the University of the City of New York in 1848. In the following year he entered the army as assistant surgeon, rising through various grades until he was made surgeon-general in 1862. After the war he practised his profession in New York City, later devoting much of his time to literature. His publications include *Sleep and Its Nervous Derangements*, 1869; *Disease of the Nervous System*, 1871; besides novels, of which may be cited *Robert Severne, A Strong-Minded Woman, Mr. Oldmixon and Dr. Grattan*, 1884.

HAMMONTON, a city of New Jersey, in Atlantic co. It is on the Altantic City and West Jersey and Seashore railroads. Surrounding it is an extensive fruit growing and poultry raising region of which it is the center. It has important manufactures of shoes, cut glass, underwear, optical instruments, etc. Pop. 1920, 6,417.

HAMMURAPI, sometimes called Hammurabi or Khammurabi, King of Babylon (2124-2081 B.C.). He was the *s.* of Sinmuballit and the sixth ruler of the first Babylonian Dynasty. A reference in the 14th chapter of *Genesis* would indicate that he participated with Chedorlaomer in a raid on Syria. During the first half of his reign he was occupied with the conquest of Mesopotamia. It is probable that Assur and Nineveh were included in his kingdom, although they may have acknowledged a shadowy suzerainty of Assyria. He was one of the greatest and noblest of Babylonian kings, and his celebrity is based not so much on his conquests as on his wisdom and organizing ability. Many important undertakings for the benefit of his kingdom such as the building of canals, construction of granaries as a safeguard against famine and the development of the financial resources of his realm are recorded in ancient inscriptions. He took pride in the title 'King of Righteousness'. He reorganized the judiciary, freed himself to some extent from the domination of the priesthood and devoted himself to the administration of justice. The code of Hammurapi (*q.v.*) is one of the most enlightened and interesting law compilations of ancient times.

HAMMURAPI OR HAMMURABI, CODE OF, a system of laws codified by the Babylonian king of that name (*q.v.*) engraved on a block of diorite discovered

by De Morgan on the Acropolis of Susa 1901-02. There are 282 paragraphs in the code, comprising laws that deal respectively with property and persons and having many subdivisions. There is no religious legislation in the code, which is civil throughout. The legal principles on which the code are based are in the main wise and humane, and compare favorably with those of the Mosaic code. The latter in fact may have been influenced to some extent by the former. The weak, the poor, the widow and the orphan are protected against injustice from the powerful and rich. A woman had the right to own and dispose of property and she could also divorce her husband on certain grounds. Even the slave had certain legal rights. An advanced economic condition is shown by laws concerning land owners, deposits, loans, debts and other features of trade, property and commerce. It is impossible to tell how much of the code is due to Hammurabi's own conceptions of justice and equity and how much had already been embodied in collections of law compiled by earlier monarchs, but the principles laid down are far in advance of those contained in the legislation of other nations of that period.

HAMPDEN, JOHN (*c.* 1595-1643), Eng. politician; entered Parliament, 1621; chiefly famous for his refusal to pay ship-money (*q. v.*) in 1637; his trial before Court of Exchequer resulted in judgment against him, 1638. He was a determined opponent of Charles I., and a member of Short and Long Parliaments; had share in prosecution of Strafford; was one of five members impeached by Charles in 1642. On outbreak of Civil War he raised troops for Parliament; mortally wounded at Chalgrove Field, 1643.

HAMPDEN, WALTER, (WALTER HAMPDEN DOUGHERTY), (1879), Actor. *B.* in Brooklyn, N. Y.; student at Harvard and Bachelor of Arts, 1900 of Polytechnic Institute of Brooklyn. In 1901 with E. R. Benson's Company, made first appearance on stage in England. For three seasons at the Adelphi Theatre in London, was leading man. In 1905 succeeded the younger Irving as Hamlet. Returned to United States in 1907 and supported Alla Nazimova at Bijou Theatre, New York. Appeared in 'The Servant in the House', 'The Master Builder', 'The Yellow Jacket' and others. Has toured in Shakespearean repertoire.

HAMPDEN-SIDNEY COLLEGE, institution located at Hampden-Sidney, in Prince Edward co., Va. It was founded under Presbyterian auspices in 1776 and seven years later was incorporated under the laws of Virginia. Some of the most famous names of Revolutionary history, such as Patrick Henry, James Madison and others, were among the incorporators of the institution. The college owns a property of 250 acres. It has classical and scientific courses leading to the usual degrees. The library has more than 25,000 volumes. In 1923 there were 180 students in attendance and a teaching staff of ten professors.

HAMPSHIRE, SOUTHAMPTON, Hants (51° N., 1°30′ W.), county, S. England; bounded N. by Berkshire, W. by Dorset and Wiltshire, S. by Eng. Channel, E. by Surrey and Sussex. Isle of Wight, separated from mainland by Solent and Spithead, is included in county. On coast are Portsmouth Harbour, Southampton Water, Christchurch and Poole Bays; inland are fertile valleys, hills, and woods.

Chief towns: Southampton (one of chief ports in kingdom), Portsmouth, Winchester, Christchurch, Lymington, and Romsey, seaside resorts at Bournemouth, Milford, Southsea; and in Isle of Wight, Cowes, Ryde, Ventnor, and Newport; Aldershot, military training centre. Sheep, cattle, and horse-rearing, fishing, shipbuilding, brewing, tanning are carried on. Pop. 950,000.

HAMPSTEAD (51° 33′ N., 0° 11′ W.); a N.W. district and residential suburb of London; associated with the names of Pope, Keats, Shelley, and many other men-of-letters; H. Heath is a popular pleasure-ground. Pop. 1921, 86,080.

HAMPTON, a town of Virginia, in Elizabeth co., of which it is the county seat. It is on the Chesapeake and Ohio Railroad, and on the James River. It is connected by steamship lines with various ports. Hampton is a favorite summer resort. It has excellent bathing ground at Old Point Comfort. It is within two miles of Fortress Monroe. Its chief industry is oyster fishing. It has, however, manufactures of brick and fish oil. Hampton is the seat of the Hampton Normal and Agricultural Institute for Indians and Negroes, and it has also a national soldiers' home and a national cemetery. Pop. 1920, 6,138.

HAMPTON, village, Middlesex, England (51° 25′ N., 0° 22′ W.), on Thames. Pop. 10,500. *Hampton Court,* a former royal residence; fine gallery of paintings.

Hampton Court Conference was summoned by James I. 1604, as a result of Millenary Petition, presented by the Puritan clergy 1603, proposing changes in the Prayer-book. Conference, which consisted of Archbishop of Canterbury,

bishops, church dignitaries, and four moderate Puritans, was a farce from point of view of Puritans, and no reasonable concessions were made.

HAMPTON, WADE (1818-1902), American Confederate commander; *b.* Columbia, S. C. He graduated from the University of South Carolina, studied law but never entered on its practice, devoting his time to the management of his extensive plantations. He served in both houses of the South Carolina legislature. He was a Union Democrat, but went with his State when it seceded, raised and equipped at his own expense a large body of troops called 'Hampton's Legion' and served on the Confederate side with great distinction throughout the war. He fought at Bull Run, Seven Pines, Gettysburg and in the Shenandoah. By 1864 he had reached the rank of lieutenant general and had command of Lee's entire cavalry force. Later, with Johnston, he fought bravely but unsuccessfully to stem Sherman's march to the sea. He assisted vigorously in the reconstruction of the South following the conflict. Served as governor of his State 1876-78 and in the latter year was chosen to the United States Senate, serving until 1891. He was U. S. commissioner of railroads from 1893 to 1897.

HAMPTON NORMAL AND AGRICULTURAL INSTITUTE. Founded in 1868 for the education of negroes and indians at Hampton, Va. under the auspices of the American Mission Association; chartered in 1870. The inception of the institution was largely due to General Samuel Chapman Armstrong, director 1868-1893. The institute has an endowment fund of about $1,500,000, yearly income about $300,000; the property covering 188 acres near Hampton Roads contains 60 buildings. There are four educational divisions, academic, agricultural, trade, and graduates. Students may work for wages six days in the week all the year, and attend night school for eight months. Their wages are held as a bond that they will carry out the promise to finish their education. The Graduates course comprises agriculture, business, domestic arts and sciences, library methods, and school teaching. Booker T. Washington was a graduate. President, Chief Justice Taft of the U. S. Supreme Court; Principal, James E. Greig. Students of both sexes 873, 1922.

HAMPTON ROADS, an arm of the Chesapeake Bay, (at the mouth of the James River. It is between Hampton and Norfolk, Va., with Newport, Old Point Comfort, Fortress Monroe and Fort Wool in the neighborhood. It is a favorite summer and winter resort and has a bathing beach, bathing places and many historical sites in the neighborhood. It is notable as being the scene of the famous battle between the Monitor and the Merrimac during the Civil War.

HAMSUN, KNUT (1860), Norweg. author; his novel *Sult*, trans, *Hunger* 1899, is perhaps most grimly powerful description of slow starvation in literature; awarded Nobel Prize for literature 1920. Other works include *Mysterier* 1893; *Norn*, 1894; *Siesta*, 1897; *Kratskow*, 1904.

HANAU (50° 9′ N., 8° 55′ E.), town Hesse-Nassau, Prussia, on Main; gold and silver work; diamond-cutting; scene of defeat of Bavarians by French, 1813. Pop. 35,000.

HANCOCK, a village of Michigan, in Houghton co. It is on the Copper Range and the Mineral Range railroads, and on Lake Portage. Transportation facilities to Lake Superior are given by a ship canal. Within the limits of the town are several important copper mines. It has also smelting works, foundries, machine shops and other industries. It is the seat of a Finnish college. Pop. 1920, 7,527.

HANCOCK JOHN (1737-1793); American statesman. *B.* Jan. 23,1737; *d.* in Quincy, Mass., Oct. 8, 1793; graduating from Harvard College in 1754 he joined his uncle in business and inherited £80,000 on the latter's death in 1764. He was several times elected a member of the Massachusetts General Court. The seizure of his sloop 'Liberty' in 1768 caused the riot in which the royal customs commissioners were nearly killed. After the 'Boston Massacre' of 1770 he was one of a committee who requested the governor to remove the troops. His oration at the funeral of the victims gave such offence to the governor that orders were given to arrest him and Samuel Adams. They were both members of the Provincial Congress over which Hancock presided. After the Concord fight Gage offered pardon to all rebels but Hancock and Adams. He was chosen president of the Continental Congress in 1775 and signed the Declaration of Independence the next year. Resigning the presidency in 1777, he remained a member until 1780, and was again elected 1785-1786. Appointed a major-general to command Massachusetts forces in the Rhode Island Expedition of 1780, he was member of the Massachusetts Constitutional Convention and governor in 1780 and annually re-elected except 1783-1785 until his

death. President of the convention of 1788 that adopted a Federal constitution.

HANCOCK, WINFIELD SCOTT (1824-1886), American soldier. *B.* in Montgomery Square, Pa., February 14, 1824; *d.* at Governor's Island, New York Harbor, Feb. 9, 1886. Graduating from the U. S. Military Academy in 1844 after service in the west he made a good record in the Mexican War and in 1855 was quarter-master at Fort Myers, Florida, during the Seminole trouble. In 1857-1858 he was on the Kansas border and quarter-master Southern Dist. of California 1859-1861; as brigadier-general of volunteers in the Civil War he commanded a brigade in the Army of the Potomac and fought at Williamsburgh and Antietam; Major-general U. S. Volunteers in Nov. 1862, he led a division at Fredericksburg which lost in that fight 2,015 out of 5,000 men. At Chancellorsville ,May 5-4 1863 he saved the Federals at a critical time and was soon called to command the Second Corps. At Gettysburg, July 2, he commanded the Federal left wing and July 3 the left centre. In a great Confederate attack Hancock lost 4,000 out of 6,000 men, and was shot from his horse. He was appointed major-general 1866 and commanded military depts. Missouri, Texas, Louisiana, 1866-1868, and Dakota 1869-1872. He ran for president in 1880 and was defeated by Garfield, the vote being 4,454,416 to 4,444,952.

HAND, see SKELETON.

HAND BALL. See ATHLETICS.

HANDCUFFS, pair of articulated steel bracelets, self-locking, fastened to each other by a chain. Used to secure prisoner; not applicable to prisoner on suspicion unless he behaves violently or attempts escape.

HANDEL, GEORGE FREDERICK (1685-1759), Anglo-Ger. composer; *b.* Halle; showed musical precocity from earliest childhood; first teacher—Zachau, organist; app. organist at Schloss and Domkirche, and studied law at Univ. of Halle, 1695; joined opera orchestra, Hamburg, 1703; visited Italy, 1709, where he became friend of Scarlattis and Corelli; app. *capellmeister,* Hanover, 1710. H. twice visited England, 1711-15; offended Elector of Hanover, but on latter's accession as George I. became reconciled by writing *Water Music* in king's honor; director of music to Duke of Chandos, 1718; directed Ital. Opera for Royal Academy of Music, London, 1720, which eventually failed; settled in England, becoming naturalised, 1726; lost eyesight towards end of life. Among best works are: Operas—*Almira, Nero,* 1705; *Daphne, Florinda,* 1708; Latin Psalms—*Dixit Dominus* and *Laudate Pueri*; oratorios—*Concerto in F,* 1715; *Passion* Oratorio, 1716. To Eng. period belong over forty operas no longer performed, and his greatest oratorios—*Chandos Anthems,* 1718-20; *Saul, Israel in Egypt,* 1738; *Samson, Messiah,* 1741; *Joseph,* 1743; *Judas Maccaboeus,* 1746; *Joshua,* 1747; *Jephtha,* 1751.

HAND GRENADES. See GRENADES, BOMBS, AMMUNITION.

HANDICAPPING, the putting of competitors in a game or contest upon an equality, by imposing penalties upon the more powerful or skilful. Time allowances, based upon tonnage and sail area, are granted in a yacht race, and in a motor-car speed trial upon weight and horse-power.

HANDWRITING, see PALAEOGRAPHY.

HANFORD, a city of California, in Kings co., of which it is the county seat. It is on the Southern Pacific and the Gulf, Colorado and Sante Fe railroads. Surrounding it is an extensive agricultural and oil producing region of which it is the center. Its industries include also fruit canning factories. It is a favorite summer resort and has two sanitariums. Among the public buildings is a public library. Pop. 1920, 5,888.

HANG-CHOW-FU (30° 20′ N., 120° 10′ E.), city, port, Che-Kiang, China, on Tsien-Tang River; centre of silk manufacture; opened to foreign commerce in 1896. Pop. *c.* 400,000.

HANGING, the method of execution employed as punishment for capital offences. As the penalty for homicide it has been employed in America and England from very early times. Thieves and pirates were hanged in chains, *i.e.* gibbeted in England—down to a comparatively recent period. The bodies were left hanging until they gradually decayed away. Hanging in chains was discontinued after 1832, and the last public execution took place in 1868. Executions are now carried out within prison walls, in the presence of the sheriff and other officials.

HANGING GARDENS. See BABYLON.

HANGO (59° 47′ N., 22° 59′ E.), seaport, Finland, on Gulf of Finland; exports wood and fish. Pop. 3,600.

HANKOW, city, river port, Hupeh, China (30° 36′ N., 114° 16′ E.), on Han, at junction with Yang-tse-Kiang; harbour accessible to Ocean steamers; wire-

less station; large transit trade; centre of commerce and finance; chief exports, tea, eggs. Pop. over 1,000,000.

HANNA, MARCUS ALONZO (1837-1904), senator of U. S. A.; important financier; chief supporter of Republican party under McKinley; one of founders of National Civic Federation, 1901.

HANNAY, JAMES (1827-73), Scot. author; wrote *Satire and Satirists*, 1854; two nautical novels, and other works.

HANNIBAL, a city of Missouri, in Marion co., It is on the Burlington, the Missouri, Kansas and Texas, and the St. Louis and Hannibal railroads, and on the Mississippi River, 110 miles N. W. of St. Louis. There is steamship communication with all the important river ports. The city has important industries including the manufacture of lime, lumber, flour, planing mill products, foundry products, etc. There is a public library, public high school, and several private schools. Hannibal was the birthplace of Samuel L. Clemens (Mark Twain). Pop. 1920, 18,950.

HANNIBAL (247-183 B.C.), a celebrated Carthaginian general, the *s.* of Hamilcar Barca. He was educated in his father's camp and trained in all the arts of military warfare. He was taken to Spain when only nine years old, and there made an oath to his father upon an alter of eternal hostility to Rome. On his father's death (229 B.C.), Hasdrubal, the son-in-law and successor of Hamilcar, placed him in command of the troops in Spain, and in 221, on the assassination of Hasdrubal, he was unanimously proclaimed by the soldiers the ruler of Carthaginian Spain, his election being later ratified by Carthage. H. crossed the Tagus and subdued the Celtiberian tribes, and before 219 he had reduced all the country S. of the Iberus, with the exception of Saguntum. In the spring of that year he laid siege to Saguntum, which surrendered after a resistance of eight months. The Romans, having made an alliance with that city, regarded H.'s action as an intended provocation to war, and demanded his surrender, which, being refused, war was formally declared between the two nations. H. prepared his army in the winter of 219, and left Spain in the following spring with some 90,000 foot, 12,000 horse, and 50 elephants (Polybius, iii. 34, 18). In the early summer he performed his brilliant march across the Alps, and on reaching Northern Italy, defeated Publius Scipio at Ticinus and at Trebia. After spending some months in winter quarters, he marched into Etruria early in 217 to the banks of the Arno. The Carthaginian army endured great suffering from the unwholesome swamps, and H. himself lost the sight of one eye. The Roman army under Flaminius was encamped at Arretium, which H. passed by on his way S. Flaminius hurried in pursuit and fell into an ambush near Lake Trasimene, the Romans being practically wiped out and the consul slain. Rome now elected dictator Q. Fabius Maximus, who, on account of his caution, won the name of 'Cunctator'. He continually harassed the Punic forces, without risking a hand-to-hand engagement. H. marched S. to Capua and into Apulia. In 216 he encountered Æmilius Paulus and Terentius Varro, and inflicted a most crushing defeat upon the Romans on the r. b. of the Aufidus, below Cannae. He wintered in Capua, nad several other southern towns revolted from Rome to his side. It has been said that the luxury prevailing in Capua enervated his troops; whether this be true or not, 216-215 mark the turning-point of his career. H. obtained some successes in the S., taking Tarentum in 212; but he did not feel himself strong enough to attack the stronghold of Rome until his army was reinforced. His *b.*, Hasdrubal, approached with his troops from Spain, but at the R. Metaurus met the Roman army under Livius and Claudius, and with most of his men was slain. H. maintained his ground in the wild, mountainous region of Bruttium from 207-203, in which year he was recalled to Africa on the success of the younger Scipio. In 202 he met Scipio at Zama, where he was defeated for the first time. He urged his countrymen to make peace with Rome and himself signed the treaty which forbade Carthage to wage war outside her own dominions without permission from Rome 201. The Romans continually urged the banishment of H., and it was felt in Carthage that the family of Barca was too great for the state. In 195, compelled by the jealousy of factions at home as well as by the enmity of Rome, he sought refuge with Antiochus III., King of Syria, who was allied with Egypt against Rome. Antiochus was defeated at Thermopylae 191, and at Myonnesus, 190, and H., fearing to be given up as a hostage of war, fled to the court of King Prusias of Bithynia. In 183 Rome sent Quintus Flamininus to demand the surrender of the fugitive, and, accordingly, to escape being placed in the hands of his enemy, H. took poison in 183. The Second Punic War may more fitly be called the Hannibalic War, for he is the one prominent figure throughout it. For military strategy and statesmanship he can only be compared with another great hero of history, Napoleon Bonaparte.

HANNINGTON, lake, Brit. East Africa; named after Bp. James Hannington.

HANNINGTON, JAMES (1847-85), Eng. missionary; first bp. of Equatorial East Africa.

HANNO (V. cent. B.C.), Carthaginian navigator; author of *Periplus*, an account of his travels.

HANNO 'THE GREAT' (III. cent. B.C.), Carthagnian general, leader of the aristocrats, and opposed to Hamilcar.

HANOI, capital, Tonkin, Fr. colony 1873; native industries. Pop. *c.* 105,000.

HANOTAUX, GABRIEL (1853), Fr. statesman and author; was minister for foreign affairs 1894-8; elected to Academy 1897; author of *Historie du Cardinal de Richelieu*, which gained him the Gobert Prize, *La France en* 1614, *Jeanne d'Arc*, *La France Contemporaine* (Eng. trans. by Tarver), *Histoire de la Guerre de* 1914 (9 vols.), etc.

HANOVER (1) Prov., Prussia (52° 30′ N., 9° E.), surrounded by North Sea, Holstein, Mecklenburg-Schwerin, Saxony, Brunswick, Hesse-Nassau, Westphalia, Lippe, Pyrmont, and Netherlands; traversed by Harz Mountains in S.E.; remainder forms part of great N. Ger. plain, covered with moor and immense stretches of heath, such as Lüneburger Heide; chief rivers, Elbe, Weser, Ems, Leine; traversed by numerous canals; principal towns, Hanover (cap.), Hildesheim, Osnabrück, Göttingen (with univ.), Borkum and Norderney (famous watering-places); rich agriculture; also coal, salt, silver, copper, iron ore, lead, pottery, asphalt, flax, tobacco, etc.; famous poultry rearing (especially geese).

Ernst August of Brunswick became Elector of Hanover 1692, and was succeeded by his *s.*, George Ludwig, who became George I. of England 1714; the union of Britain and Hanover under the Guelphs lasted until Queen Victoria's accession 1834, when Hanover passed to Ernst August (Duke of Cumberland), *b.* of William IV. Hanover sided with Austria during Austrian War of Succession 1727, with Prussia during Seven Years' War, and against Fr. Republic 1793. Hanover was made a kingdom by Congress of Vienna 1814; joined Zollverein 1854; sided with Austria against Prussia 1866; Hanovorians forced to capitulate at Langensalza, and Hanover annexed to Prussia 1866; Area, 14,862 sq. m.; pop. 2,942,400.

HANOVER, N. H. See DARTMOUTH COLLEGE.

HANOVER, town, Prussia (52° 22′ N., 9° 44′ E.), cap. of Hanover prov., on Leine; fine parks and suburbs, picture galleries, museums, stately town hall, public and royal libraries, large theatre, state palace with magnificent internal decorations and valuable art collection; manufactures—hardware, chemicals, machinery, linen, cloth, pianos, tobacco. Pop. 302,300.

HANOVER, a borough of Pennsylvania, in York co. It is on the Pennsylvania, and the Western Maryland railroads, and is surrounded by an important agricultural and iron ore region. Its industries include the manufacture of cigars, silks, water wheels, flour, furniture, wire, clothing, etc. There is a public library and a handsome high school and two parks. Pop. 1920, 8,664.

HANOVER COLLEGE, educational institution under the auspices of the Presbyterian Church, founded in 1827 at Hanover, Indiana as an academy and chartered as a college in 1833. Since 1880 it has been co-educational. It has departments of arts, letters, science, law, philosophy, and education. Tuition is free. It has an endowment fund of about $300,000 and a library of 25,000 volumes. In 1923 its enrollment of students numbered 371, and there were fifteen members in the faculty.

HANSEATIC LEAGUE, confederation of N. German towns, formed in XIII. cent. for mutual protection and for promotion of commercial privileges; exercised great influence in Europe for more than two cent's. and at one time included ninety free cities, of which most important were Lübeck. Hamburg, and Bremen, these three being still known as Hanse towns. The first confederation was formed early in XIII. cent. at Wisby, which for some years remained centre of Baltic trade, but was eventually superseded by Lübeck. Lübeck and Hamburg were united for trading and protective purposes from 1241 onwards; in 1252 they received certain privileges from Flanders, and in 1266-67 were allowed to establish their own associations in London. Early in XIV. cent. the confederation obtained important concessions from Bruges, and at later date from Bergen; in this cent. also it came into conflict with Waldemar of Denmark, who was defeated; war ended with treaty of Stralsund, 1370, by which League gained increase of power. Its importance began to decline in the XV cent.; waged war against Holland without success in first half of this cent., hostilities ending with treaty of Copenhagen in 1441. In following cent. it waged unsuccessful war against Norway

and Sweden, and by 1670 had ceased to exist.

HANTHAWADDY (17° N., 96° E.), district, Lower Burma, India; constituted a seaprate district in 1880; capital, Rangoon. Area, 3023 sq. miles. Pop. 500,000.

HANUMAN (Hindu myth.), monkey god who bridged the distance between India and Ceylon to aid Rama when searching for his wife, Sitá; hero of *Ramayana*.

HANUS, PAUL HENRY (1855), University Professor. *B.* in Silesia Prussia. In 1859 came to United States. Bachelor of Science, 1878 of University of Michigan. 1906 at University of Colorado, Doctor of Laws. Teacher, except for one year since 1878. 1891-1901 assistant professor of history and art of teaching, professor 1901-1921, professor emeritus since 1921. Member 1909-1919 of Massachusetts State Board of Education. 1909-1917 chairman of executive board, Boston Vocation Bureau. Author of 'Elements of Determinants', 1886' 'Geometry in the Grammar, School', 1894; 'A Modern School', 1905; 'School Efficiency', 1913; 'School Administration and School Reports', 1920. Writes for educational journals.

HAPARANDA (65° 52′ N., 24° 3′ E.), town, Norbotten, Sweden, at head of Gulf of Bothnia.

HAPGOOD, ISABEL FLORENCE (1850), American author and translator; *b.* Boston, Mass. She had remarkable linguistic ability and employed it in felicitous translations from Russian, French, Italian and Spanish authors. For many years she wrote speciai articles and book reviews for the New York Evening Post and the New York Sun. Besides her numerous translations, she has written *The Epic Songs of Russia*, 1886; *Russian Rambles* 1895 and *A Survey of Russian Literature*, 1902.

HAPGOOD, NORMAN (1868), American journalist and diplomat; *b.* Chicago, Ill. He graduated from Harvard in 1890 and from the Harvard Law School three years later. He engaged in newspaper work as dramatic critic and writer of special articles for the New York Commercial Advertiser and the Bookman 1897-1902. He was editor of Collier's Weekly 1903-1912 and of Harper's Weekly 1913-16. In 1919 he was appointed United States Minister to Denmark, but resigned the position within a year. In 1922 he became editor of Hearst's International Magazine. His publications include *Literary Statesmen and Others*, 1897; *Daniel Webster*, 1899; *The Stage in America*, 1901 and *Industry and Progess*, 1911.

HAPSBURG. See HABSBURG.

HARA-KIRI, method of suicide, obligatory or voluntary, by disembowelment, practised by the Samurai class in Japan; later adopted by all classes as ideal form of self-destruction. It was done by a self-inflicted cut across the abdomen with a dagger, followed by a sword stroke by another hand, which severed the head from the body. As an obligatory act, abolished in 1868. On the day of the Jap. emperor's burial 1912, General Nogi and his wife committed hara-kiri.

HARA, TAKASHI (1754-1921); a Japanese statesman. He served for a time as an official in the foreign office at home and abroad, and obtained the rank of Vice-Minister in 1895. He was one of the organizers of the Liberal party, and visited the United States as Minister of Communications in 1908. He was appointed Premier in 1918. His strong and assertive rule won him many enemies among the Conservatives, and he was assassinated on November, 4 1921.

HARALD, I., HAARFAGER (850-933), king of Norway; won battle of Hafrsfjord, 872, and conquered whole of Norway.

HARALD III., HAARDRAADA (1015-66), king of Norway; fought against Saracens; after succeeding to Norwegian throne he tried to conquer Denmark, but without success; invaded England 1066; killed at Stamford Bridge.

HARBINGER, one who goes before; originally one whose business was to provide accommodation.

HARBIN, KHARBIN (45° 46′ N., 126° 35′ E.), town, on Sungari, Manchuria; railway workshops; breweries, flourmills. Pop. 35,000.

HARBOR, a port or haven, which by its natural conformation or artificial construction affords safe refuge and anchorage to ships. A h. should be easily accessible in any weather, and should have a sufficient depth of water at all tides; the majority of h's, however, are tidal, and are provided with enclosed docks into which vessels enter at high tide. The dock gates are closed before the ebb, and a uniform level is thus maintained. Every effort is made to secure the utmost possible depth of water, as it has been calculated that the value of a h. increases as the cube of the depth. The entrance to the h. must be proportiomed to the area, as upon this depends the tranquillity of the h.

HARBOR GRACE, Newfoundland, port located on Conception Bay, 27 miles N.W. of St. John's in a direct line. Its harbor is large and capacious, and in case of storm an inner harbor, well protected, offers secure anchorage. It is second in commercial importance only to St. John's. It is the headquarters of a Roman Catholic diocese and the Catholic cathedral is the chief architectural feature of the town. Pop. 4,729.

HARBORD, JAMES GUTHERIE (1866), an American soldier, *b.* in Bloomington, Ill. He graduated from the Kansas State Agricultural College, in 1886, and three years later enlisted in the army as a private, passing through the non-commissioned grades within two years, after which he was commissioned second lieutenant of cavalry. From 1903 to 1914 he served as assistant chief of the Philippines constabulary. with the rank of colonel. From May, 1917, until May, 1918, he was chief of staff of the American Expeditionary Force in France. During June and July of 1918 he had command of the Marine Brigade which fought at Chateau Thierry. He commanded the Second Division which participated in the Soissons offensive during July 18-20, 1918. Shortly after he was given command of the Service of Supply, becoming again Chief of Staff in May, 1919, being promoted to the rank of major-general in the regular army in September. In 1921 he was appointed department chief of staff of the U. S. Army, but resigned to enter business in 1922. General Harbord stands forth as one of the most distinguished American officers.

HARBURG (53° 28′ N., 9° 59′ E.), seaport, Hanover, Prussia, on Elbe; manufactures palm-oil, rubber goods, chemicals; active trade. Pop. 70,000.

HARCOURT, SIMON, 1ST VISCOUNT HARCOURT (*c.* 1661-1727), Eng. lord chancellor; called to Bar, 1683; solicitor-gen., 1702; helped to promote Union with Scotland; attorney-gen., 1707, 1710; defended Sacheverell, 1710; Lord Keeper of Great Seal, 1710; Lord Chancellor, 1713; P. C., 1721.

HARCOURT, SIR WILLIAM GEORGE GRANVILLE VENABLES VERNON (1827-1904), Brit. statesman; P.C., 1866; knight and solicitor-gen., 1873; Sec. of State under Liberal government, 1880; Chancellor of Exchequer, 1886, 1892-95; reformed incidence of death duties, 1894. His Local Veto Bill was one of the causes of Liberal defeat. 1895; leader of Opposition, 1895-98, and continued to be prominent parliamentary figure; constant political writer.

HARCOURT, WILLIAM VERNON (1789-1871), Eng. ecclesiastic canon of York, etc.; deeply interested in scientific subjects; founder and pres. of Brit. Association.

HARDANGER, FJORD (60° 20′ N.; 6° 10′ E.), inlet, on W. coast, Norway; magnificent scenery; tourist resort.

HARDEE, WILLIAM JOSEPH (1815-73), American Confederate military commander; *b.* Savannah, Ga. He graduated at the United States Military Academy in 1838; served in the Mexican War and when the Civil War broke out entered the Confederate service as colonel. He fought with distinction at Shiloh, where he headed an army corps, and commanded the left wing at the battle of Perryville. He was entrusted with the command of Savannah against Sherman in the last months of the war. From 1862 his rank was that of lieutenant general.

HARDEN, MAXIMILIAN (1862), Ger. journalist and publicist; began life as an actor, then becamedramatic critic; founded famous weekly review, *Die Zukunft*; caused great sensation by exposure of court scandals 1907; stood trial, but drove his accusers from public life; his paper suppressed on several occasions during World War; did not scruple to expose blunders of the Pan-Germans; popular lecturer.

HARDERWIJK (52° 22′ N.; 5° 37′ W.), seaport, Netherlands, on Zuider Zee; chief exports, grain, fish. Pop. 8,000.

HARDICANUTE, OR HARDACNUT (*c.* 1019-42), king of England; *s.* of Canute; succ. his half-bro., Harold, 1040.

HARDIE, JAMES KEIR (1856-1915); British Labor leader and politician; worked in coal mines between ages of 7 and 24; in Parliament 1892-5; again from 1900 till his death; proprietor and ed. *Labor Leader*; visited India and Australia in 1907; leader of Labor party in House of Commons 1906-15.

HARDONG, SAINT STEPHEN (*c.* 1050-1134), third abbot of Citezux; received St. Bernard into abbey and helped Cistercian reform.

HARDING, HENRY, VISCOUNT H. (1785-1856), Brit. gen. and Ind. gov.; distinguished in Napoleonic wars; Gov.-Gen. of India, 1844-47; fought in second Sikh War, 1845-46; commander-in-chief of Brit. army, 1852-56; field-marshal, 1856.

HARDING, WARREN GAMALIEL (1865-1923), twenty-ninth President of the United States; *b.* near Blooming Grove, Ohio. His *f.* was a physician in moderate circumstances, and the future

President, in the intervals between sessions of the district school that he attended, worked at various occupations on farms, in the village and at one time with the construction force of a railroad. In 1879 he entered Ohio Central College at Iberia and studied there for three years. For a time he was the editor of the college paper and this gave him a bent toward newspaper work which persisted after he left the institution. He learned the printer's trade and became an expert at typesetting, both by hand and machine. Then he entered the service of the Marion (Ohio) Daily Star, first as reporter, later as editorial writer, and in 1884 purchased the paper. Soon his energetic and fearless editorials began to attract attention outside the confines of the town, and he became a leader and moulder of public opinion in the State. When the paper had become very profitable and influential, he organized the Harding Publishing Co., and made it possible for such of his employes as so desired to become stockholders in the business. His broad and generous policy has kept him immune from strikes and labor troubles.

Engaging actively in Republican politics, he was chosen a member of the Ohio State senate 1900-04. The qualities he showed as a debater and legislator in this body led to his election as lieutenant governor 1904-06. In 1910 he was the Republican candidate for governor, but was defeated. He supported Taft in the presidential campaign in 1912, and in 1914 was elected to the United States Senate by a plurality of more than 100,000 votes. In that body he served on a number of important committees, including those on Commerce and Foreign Relations, and won the respect and esteem of his colleagues by his moderation, tact and sagacity. He was eloquent in debate, the impressiveness of his views being added to by an unusually rich and resonant voice. For some time before the meeting of the Republican National Convention, it had become evident that he would be one of the leading candidates for the Presidential nomination, and when that convention met he was chosen to head the ticket on the tenth ballot, receiving 692½ votes to 156 for Major General Leonard Wood, his nearest competitor. His speeches during the campaign materially furthered his cause, and on Nov. 2, 1920 (his 55th birthday), he was chosen President by the largest plurailty ever given to a candidate. The electoral vote stood: Harding 404; Cox 127. The popular vote was: Harding 16,138,914; Cox, 9,142,438.

Mr. Harding was inaugurated President, March 4, 1921. His choice of a Cabinet met with general approval, especially the selection of Charles E. Hughes as Secretary of State. In the administration of his office, President Harding was cautious, deliberate and independent. He did not ask to dominate Congress, nor on the other hand did he yield to its domination. On several occasions he addressed in person a joint Congressional session on subjects that he had much at heart. He vetoed the soldiers'bonus bill that both Houses had passed. He saw with regret the failure of the Ship Subsidy bill, which he had vigorously advocated. He was unceasing in his efforts to bring Government expenditures within Government income. Notable features of his administration were the signing of the separate treaty with Germany, the adjustment with Japan of the controversy over the Island of Yap and the Conference on the Limitation of Armaments, which was called by him and which resulted in the signing of six important treaties designed to assure the peace of the world. In Feb. 1923, he sent a message to the Senate urging participation by the United States in the World Court, consideration of which however, was deferred by that body intil the next session in December.

In July, 1923, Mr. Harding undertook an extensive tour through the western part of the United States and Alaska. During its progress he made many speeches explaining and expounding the great policies of his administration. He was received in Alaska with great enthusaism as he was the first President to visit that Territory. Mr. Harding become greatly fatigued during this journey and suffered ptomaine poissoning from some food of which he partook. On his arrival in San Francisco, late in July, he was taken ill and after apparent recovery, died suddenly from apoplexy on August 2, 1923.

In 1891 Mr. Harding married Miss Florence Kling of Marion, Ohio. They had no children.

HARDING, WILLIAM P. GOULD (1864), Banker. *B.* in Alabama. Graduate of University of Alabama. At Berney National Bank, 1886-1896 bookkeeper to cashier. Vice-president, 1896 and from 1902-1914 president of First National Bank of Birmingham, Member of Federal Reserve Board of Washington and governor Federal Reserve Board 1916-1923. 1918-1919 mining director of War Finance Corporation. President of Alabama State Bankers Association and Birmingham Chamber of Commerce.

HARDINGE OF PENSHURST,

CHARLES, 1ST BARON (1858), Brit. diplomat; entered diplomatic service 1880; secretary of legation to Teheran 1896; secretary of embassy at Petrograd 1898-1903; ambassador to Russia 1904-6; permanent under-secretary for foreign affairs 1906-10; viceroy of India 1910-16; under-secretary for foreign affairs 1916-18; appointed ambassador to France in succession to Lord Derby Sept. 1920.

HARDT MOUNTAINS (49° 18′ N., 7° 40′ E.), N. extension of Vosges mountains, in Bavarian Palatinate, Germany; average elevation, 1300 ft.

HARDWAR (29° 58′ N., 78° 13′ E.), town, on Ganges, United Provinces, Brit. India; place of pilgrimage; every twelfth year a sacred festival is held. Pop. 30,000.

HARDY, ARTHUR SHERBURNE (1847), American educator, author and diplomat; *b.* Andover, Mass. He graduated from the United States Military Academy in 1869, served nearly a year in the army and then spent some years abroad studying civil engineering. From 1878 to 1893 he was professor of mathematics in Dartmouth College. He edited the Cosmopolitan Magazine 1893-95; entered the diplomatic service and was U. S. Minister to Persia 1897-99 to Greece, Rumania and Serbia 1899-01 to Switzerland 1901-03 and to Spain 1903-05. His publications include *Elements of Calculus*, 1890; *His Daughter First*, 1903; *Aurelie*, 1912; *Diane and Her Friends*, 1914; *Helen*, 1916 and *No.* 13, *Rue du Bon Diable*, 1917.

HARDY, THOMAS (1840), Eng. novelist and poet; famed for his 'Wessex' novels, including *Far from the Madding Crowd* 1874; *Tess of the D' Urbervilles*, 1891. Of late years he has devoted himself entirely to poetry, and has pub. *Wessex Poems*, written 1865 onwards 1898; *The Dynasts*, a Napoleonic drama 1904-8, and several vols. of lyrical poems; his two latest vols. are *Selected Poems* 1916, and *Moments of Vision* 1917; *Collected Poems*, 1919.

HARDY, SIR THOMAS MASTERMAN, BART. (1769-1839), Brit. vice-admiral; captain of the *Victory* at *Trafalgar*, and greatly esteemed by Nelson, who *d.* in his arms.

HARE, LEPUS EUROPŒUS, rodent closely allied to rabbit, but larger and speedier owing to superior development of hind limbs; differs also from rabbit in solitary life, in not forming burrows, and in young being born fully furred and with open eyes.

HARE, AUGUSTUS JOHN CUTHBERT (1834-1903), Eng. author; wrote *Memorials of a Quiet Life*, and numerous travel books.

HARE, SIR JOHN (1844), Eng. actor; first appearance on stage, Liverpool 1864. His most notable appearances were in *Caste*, *A Pair of Spectacles*, *A Quiet Rubber*. *z*

HAREBELL, Campanulaceous plant (*C. rotundifolia*) with blue flowers; popularly termed bluebell; name also applied to wild wood-hyacinth.

HARELIP, congenital vertical cleft in upper lip; may be *single* or *double*; often associated with cleft palate.

HAREM OR SERAGLIO, name given in Muhammadan countries to the apartment in a palace or house set apart for the use of the wives and concubines of the owner. The name is also applied collectively to the women themselves. The law of the Koran only permits of a man having four wives, but he is not limited in the number of his concubines. Each wife has a separate establishment within the h., and is waited upon by a separate staff of servants. A woman must always appear veiled except before her husband or immediate male relatives. The h. is guarded by eunuchs.

HARFLEUR (49° 29′ N., 0° 17′ E.); seaport town, Seine-Inférieure, France; potteries, distilleries; iron foundries. Pop. 3,000.

HARGRAVES, EDMUND HAMMOND (1816-91), discoverer of Australian goldfields; went to Australia 1824, then tried gold-digging in California 1849; returned to Australia and found gold 1851 at Lewis Pond Creek (Blue Mts.).

HARGREAVES, JAMES, a Lancashire weaver, inventor of spinning-jenny, through which he suffered much persecution from fellow-workmen; *d.* 1778.

HARI-RUD, HERI-RUD (34° 40′ N., 61° E.), river, Afghanistan; rises in the chain of Koh-i-Baba, flows N. and W., and loses itself in the Tejend oasis.

HARKNESS, ALBERT (1822-1907), Amer. classical scholar; author of numerous extensively used textbooks, including *Complete Latin Grammar* 1898.

HARLAN, JOHN MARSHALL (1833-1911), American jurist; *b.* Boyle co., Kentucky. He graduated from Center College of that State, and after a course in law at Transylvania University began the practice of law at Frankfort. He served on the Union side in the Civil War as colonel. He was attorney gener-

al of his State 1863-66 and was a candidate for the nomination of vice-president in the Republican National Convention in 1872. In 1877 he was made associate justice of the United States Supreme court, in which position his opinions were notable for their breadth of view and knowledge of underlying legal principles. In 1893 he served as a member of the Bering Sea Arbitration Tribunal.

HARLAN, OTIS, Actor. *B.* in Zanesville, Ohio. Made his professional debut in New York at 14th Street Theatre. Played part of Romantic Young Man in 'A Hole in the Ground', 1887. Toured in 'Little Puck' with Frank Daniels. Played Major Yell in 'A Texas Steer'. In 1896 scored success in 'A Black Sheep' as Hot Stuff. 1907 toured in 'The Parisian Model' with Anna Held. Played in 'Little Boy Blue', as Dupont in 1911.

HARLAND, HENRY (1861-1905)' pseudonym 'Sidney Luska', Anglo-American author; *b.* St. Petersburg, Russia' He received his education at Harv. University, was for a time in the surrogate's office, New York 1883-86 and later edited 'The Yellow Book' in London, Eng. His publications, which have had a wide circulation in English-speaking countries, include *The Land of Love*, 1887; *My Uncle Florimond*, 1888; *The Cardinal's Snuff-box*, 1900 and *My Friend Prospero*, 1904.

HARLAND, MARION. See TERHUNE, MARY VIRGINIA.

HARLAW, battlefield near Inverurie, Aberdeenshire, where Earl of Mar defeated Donald, Lord of the Isles, 1411.

HARLEM RIVER, a tidal river which separates the island of Manhattan from the mainland. It joins the Hudson River on the W. by way of Spuyten Duyvil Creek, and joins the East River at Hell Gate. The total length of the river is about 7 miles. It is spanned by several bridges and is pierced by tunnel carrying city subway lines. The Harlem Canal, which connects with the East River was opened on June 17, 1895. The Harlem River is one of the important commercial arteries of New York City.

HARLEQUIN, familiar figure in the modern pantomime; supposed to be an invisible mischievous sprite; derived originally from early Ital. comedy.

HARLINGEN (53° 10′ N., 5° 24′ E.), seaport, Friesland, Netherlands, on Zuider Zee; various manufactures; exports dairy and farm produce. Pop. 11,000.

HARMODIUS, a young Athenian, who with his friend, Aristogeiton, was concerned in the assassination of the tyrant, Hipparchus. Both were slain, but after death were revered as heroes 514 B.C.

HARMON, JUDSON (1846), an ex-governor of Ohio, *b.* in Newton, Ohio. He graduated from Denison University, in 1866, studied in the Cincinnati Law School, then began to practice. He was mayor of Wyoming, Ohio, during 1875-6; judge of the State Court of Common Pleas, 1876-7; of the State Superior Court, 1878-87; Attorney-General in the cabinet of President Cleveland, 1895-7; and since 1896 he has been professor of law at the University of Cincinnati. He was Governor of Ohio during 1909-11 and again during 1911-13.

HARMONIA (classical myth.), *d.* of Ares and Aphrodite, and wife of Cadmus; was possessor of a necklace which brought woe to those who wore it.

HARMONIC ANALYSIS is a general mathematical method of investigating certain physical problems such as wave motion, pendulum motion, vibrations of strings and springs, etc. A particle is said to move with Simple Harmonic Motion if, starting from rest, it moves in a straight line with an acceleration always directed towards a fixed point.

HARMONICA, term applied to musical instruments consisting of glasses tuned with more or less water, and producing sound by friction, or bell instruments of percussion; in vogue during XVIII. cent. now a toy instrument.

HARMONIUM, a keyed instrument, somewhat resembling piano and organ, which produces sounds by means of 'free vibrating reeds', used in churches, halls, etc., in place of the costlier organ. Although the guiding principle was then far from new, h's were first constructed in France by Grenié at the beginning of XIX. cent. and called *Orgue Expressif.* Various improvements were made in France and elsewhere (notably by Debain, Alexandre, and Mustel of Paris); but h.-construction was revolutionised by invention of *American Organ.*

HARMONY is the combination of several sounds. These combinations are termed *Chords*, which in their formation and progression are determined by fixed laws. The union of any bass-note with its 3rd and 5th (for instance, C, E, G) is called a chord or *Triad*; it may be either 'Concord' or 'Discord,' and may be formed on any note of the major or minor scale. *Concords* or *Common Chords* are those which seem

complete in themselves. *Discords* are incomplete in themselves, and must be resolved to a concord before the ear is satisfied. By the addition of the 7th to any triad the *Chord of the 7th* is formed, the principal one being the *Chord of the Dominant 7th*, which usually resolves to the tonic chord.

HARMSWORTH, SIR ALFRED CHARLES. See NORTHCLIFFE, LORD.

HARNACK, ADOLPH VON (1851), Ger. Church historian; prof. at Leipzig, Giessen, Marburg, and Berlin; was appointed general director of Royal Library, Berlin 1905; his historical insight has gained him world-wide reputation; his publications include *Lehrbuch der Dogmengeschichte* 1886-90; *Grundriss der Dogmengeschichte* (trans 1893); *The Sayings of Jesus*, 1908.

HARNESS. See SADDLERY.

HARO, Norman cry to a ruler for redress of wrong.

HAROLD I., HAREFOOT (*d.* 1040), king of England; succ. Canute as his elder *s.*, though opposed by *b.* Harthacnut in Wessex.

HAROLD II. (*c.* 1022-66), Eng. king; Earl of Wessex, 1053; elected king, 1066; routed and killed his *b.* Tostig and Hardrada, king of Norway, at Stamford Bridge, 1066; was defeated and slain at Hastings by William the Conqueror.

HAROUN AL-RASCHID. See HARUN ER RASCHID.

HARP, largest and one of the oldest instruments; played by plucking or striking strings with fingers or plectrum; has survived from earliest times in almost original form—triangular and remarkably graceful in line. H. was in common use in ancient Egypt, and held in highest honour by Celts, Franks, and Northmen. Old Brit. and continental bards accompanied their lays on h. The national symbol of Ireland is still the h. (*Clairseach*).

HARPER, GEORGE M'LEAN (1863) an American University Professor; *b.* in Shippensburg, Pa. He graduated from Princeton University, in 1884, was on the staff of the New York Tribune for a year, then spent two years abroad. On his return he was employed for two years on the staff of Scribners' Magazine. Since 1900 he has been professor of English literature at Princeton University. He is the author of 'The Legend of the Holy Grain', 1896; 'Masters of French Literature', 1901; 'William Wordsworth; his Life, Work and Influence', 1916; 'John Morley and Other Essays', 1920; and 'Wordsworth's French Daughter', 1921.

HARPER, IDA HUSTED. Writer, lecturer. *B.* in Indiana. Graduate of Muncie, Indiana High School. For two years studied at University of Indiana. Leland Stanford, Jr. University for two years. Conducted 'A Woman's Opinions' department in Terre Haute Saturday Evening Mail. For five years, department editor for New York Sunday Sun. Four years on Harper's Bazaar. Speaker at International Woman Suffrage Alliance in London, Paris, Amsterdam and Berlin. Author 'Life and Work of Susan B. Anthony', 1898, 1908; 'History of Woman Suffrage to Close of 19th Century, (with Susan B. Anthony).

HARPER, WILLIAM RAINEY (1856-1906), an American university president, *b.* in New Concord, Ohio. He graduated from Muskingum College, in 1870. During 1879-86 he was professor of Hebrew at the Baptist Union Theological Seminary, in Chicago; and professor of Semitic languages and biblical literature at Yale University, during 1886-91. In the latter year he became president of the newly established University of Chicago. For some years he was director of the Chatauqua system. He wrote *Elements of Hebrew*, 1890; *The Trend in Higher Education*, 1905 and *The Priestly Element in the Old Testament*, 1905.

HARPER'S FERRY, a town in West Virginia, in Jefferson co. It is on the Baltimore and Ohio Railroad, and on the Shenandoah and Potomac rivers. It has great historical importance from its association with John Brown. It was the site of a United States Government foundry, arsenal and armory which, in 1859, was seized by John Brown and a band of associates. Brown was quickly captured and was executed. The government buildings were burned in 1864 to prevent their falling into the bands of the Confederates. The Union army, in 1862, surrendered here to 'Stonewall' Jackson. Harper's Ferry is the seat of Storer College. Pop. about 1,000.

HARPIES, THE (classical myth.), monsters who served the gods; bird-like and horrible; best known from connection with the blind Phineus, whose food they kept defiling or carrying off; they were driven off by Argonauts (*q.v.*).

HARPIGNIES, HENRI (1819-1916), Fr. landscape painter, of greatd elicacy and finish.

HARPOON, powerful dart used in whale-fishing; formerly thrown by hand, but now chiefly fired from a harpoon-gun.

HARPSICHORD, prototype of the modern grand piano, which still retains external appearance of earlier instrument. Instead of hammer action of piano, harpsichord had its tones produced by action of points of quill or of hardened leather called 'jacks,' which plucked or twitched strings when keys were depressed; was superseded by piano in latter part of 18th cent.

HARPY EAGLE. See EAGLE.

HARRADEN, BEATRICE (1864), Eng. novelist; best-known books: *Ships that Pass in the Night*, 1893; *Interplay*, 1908; *Where your Treasure is*, 1918; *Spring shall Plant*, 1920.

HARRAN, CHARRAN (33° 30′ N., 36° 35′ E.), town of Palestine; supposed dwelling-place of Laban in the Old Testament.

HARRAR, HARAR (9° 19′ N., 42° 6′ E.), town, Abyssinia, N. E. Africa; encircled by walls; trading centre; coffee, durra, tobacco. Pop. *c.* 39,000.

HARRIER, breed of hounds, for hunting hares, like small foxhound.

HARRIMAN, EDWARD HENRY (1848-1909), an American financier, *b.* in Hempstead, L. I., N. Y. He was the *s.* of a clergyman and received his early education in Trinity School, in New York City. At the age of fourteen he entered the office of a stock broker as a clerk. So adept did he become in the business of finance that before the age of 22 he was a member of the New York Stock Exchange. In 1872 he founded the firm of Harriman & Co., and speculated so successfully that in a few years he controlled a large fortune. In 1883 he and Stuyvesant Fish began certain financial operations involving control of the Illinois Central, the Union Pacific, the Central Pacific and the Southern Pacific railroad companies, and the Oregon Railroad and Navigation Co. The outcome was that Mr. Harriman secured control of the traffic between Chicago and the Pacific Coast. In 1901 he entered into the notorious struggle with James J. Hill for control of the Northern Pacific Railroad, in which, however, he was beaten, and again by Thomas F. Ryan, by the latter in a fight for control of the Equitable Life Insurance Co. The result was a financial crisis, leading to an investigation of the Harriman lines by the Interstate Commerce Commission, in 1906, which showed Harriman to hold a virtual monopoly of trans-continental transportation. He *d.* leaving an estate of over $200,000,000.

HARRIS, ABRAM WINEGARDNER (1858), University President. *B.* in Philadelphia. Has degrees from various colleges. From 1880-1881 at Williamsport, Pa. teacher of mathematics in Dickinson Seminary; 1881-1884 tutor of mathematics and registrar, 1885-1888 at Wesleyan University instructor of history; 1888-1891 assistant director and 1891-1893 director. From 1893-1901 at University of Maine, president; at Port Deposit, Maryland, director of the Jacob Tome Institute; 1906-1916 president of Northwestern University. Since 1916, secretary of Board of Education of Methodist Episcopal Church. 1915-1917 president of American Social Hygiene Association. Trustee of Drew Theological Seminary and Wesleyan University.

HARRIS, CORA MAY (WHITE), (MRS. L. H. HARRIS) (1869), an American author, *b.* at Farm Hill, Ga. She received a private education and began writing in 1899, her first articles appearing in The Independent. Her series of 'Brasstown Valley Stories' appeared in the American Magazine during 1905-9. Among her books are 'A Circuit Rider's Wife', 1910; 'Eve's Second Husband', 1910; 'Co-Citizens', 1915; 'Making Her His Wife', 1918; 'Happily Married', 1920 and 'My Son', 1921.

HARRIS, FRANK (1854), an Irish-American editor and writer, *b.* in Galway, Ireland. He came to the United States at the age of sixteen and later studied at the universities of Kansas, Paris, Heidelberg, Strassburg, Göttingen, Berlin, Vienna and Athens. In 1875 he was admitted to the Kansas bar, but later returned to Europe, becoming editor of The Evening News and The Fortnightly Review, in London. He later returned to the United States, becoming owner and editor of Pearson's Magazine, in New York. He is the author of 'The Bomb—a Story of the Chicago Anarchists of 1886', 1909; 'The Man Shakespeare', 1909; 'Unpathed Waters', 1913; 'Contemporary Portraits', 1914; 'Great Days', a novel, 1914; 'The Life and Confessions of Oscar Wilde', 1916; and two further series of his 'Contemporary Portraits', 1919 and 1921.

HARRIS, ISHAM GREEN (1818-1897), an American statesman, *b.* in Tullahoma, Tenn. From 1849 to 1853 he was a member of Congress and was Governor of Tennessee from 1857 to 1863. He served as an officer in the Confederate army during the latter part of the Civil War. After the end of the war he engaged in the practice of law in Memphis, and in 1887 was elected United States Senator. He was successively re-elected until his death. In

1893 he was chosen president pro tempore of the Senate.

HARRIS, JOEL CHANDLER (1848-1908), an American writer, *b.* in Eatonton, Ga. As a youth he served a term as a printers' apprentice, then took up newspaper work, becoming a member of the staff of the Savannah Daily News in 1871. Five years later he became connected with the Atlanta Constitution, on whose staff he remained for over 25 years. It was in that paper that his famous 'Uncle Remus' sketches first appeared. His negro dialect stories have facinated the children of two generations, and are now as widely read as ever. Among his many books are *Folk Lore of the Old Plantations*, 1880; *Daddy Jake, the Runaway*, 1889; *Balaam and His Master*, 1890; *Mr. Rabbit at Home*, 1895 and *Uncle Remus and Br'er Rabbit'*, 1907.

HARRIS, JOHN HOWARD (1847), University President. *B.* in Indiana, Pa.; served eighteen months with the Union Army; Bachelor of Arts, 1869 of Bucknall University, Doctor of Philosophy, 1884; Lafayette College, Doctor of Laws of Colgate and Dickinson Colleges in 1891. Founded the Keystone Academy in 1869 and principal from 1869-1880. 1889-1919 was president of Bucknall University. Professor of Psychology same since 1889.

HARRIS, THOMAS LAKE (1823-1906), Amer. poet and founder of a new religion accepted by many prominent people; of great gifts, but practised black magic and probably fraud.

HARRIS, WILLIAM TORREY (1835-1909), Amer. educational reformer and philosophical writer.

HARRISBURG, a city of Illinois, in Saline co., of which it is the county seat. It is on the Cleveland, Cincinnati, Chicago and St. Louis, and the Southern Illinois Railway and Power Company railroads. The surrounding country is an extensive agricultural and coal mining region. The industries include flour mills, wagon shops, sawmills, etc. Among the public buildings is a library and a post office. Pop. 1920, 7,125.

HARRISBURG, a city of Pennsylvania, the capital of the State, and the county seat of Dauphin co. It is on the Pennsylvania, the Philadelphia and Reading, the Cumberland Valley, and the North Central railroads, and on the Susquehanna River, 160 miles W. of Philadelphia. It is an important railroad center and has direct connection with the coal and iron resources of the State. Harrisburg is a handsome city, well laid out and is surrounded by picturesque country. The State Capital, which is one of the finest State executive buildings in the country, is locatedin the midst of a beautiful park of 10 acres. Fort Washington, just across the Susquehanna River, marks the most northern point of the Confederate advance during Lee's invasion of Pennsylvania. The battlefield of Gettysburg is 46 miles to the south. The river is crossed by the Rockville four-track railroad bridge, 5 miles to the north, the largest stone arch bridge in the world. Hershey Park and a model town of the Hershey Chocolate Company is 12 miles to the east. Harrisburg has an excellent school system with over 35 public schools, two junior high schools, and many private schools. The total enrollment is about 15,000. It is the seat of a Roman Catholic bishop and has many hotels, a home for the friendless, and a children's industrial home. The city is of great importance industrially and has plants for making of machinery, boilers, brick, castings, brooms, leather, cotton goods, iron, steel, clothing, flour, etc. There is also a large trade in dairy and farm products. There are four national banks. The city was founded in 1785 by John Harris and was incorporated as a borough in 1791. It became the capital of the State in 1812 and in 1860 received its charter as a city. Pop. 1920, 75,917.

HARRISON, a city of New Jersey, in Hudson co. It is on the Pennsylvania, the Lackawanna and the Erie railroads, and on the Passaic river. It is an important industrial community and has manufactures of cotton, thread, electric supplies, trunks, leather goods, iron and steel products, furniture, etc. It has a public library and a high school. The city was settled in 1688 and was incorporated in 1873. Pop. 1920, 15,721.

HARRISMITH (28° 24′ S., 28° 36′ E.), town Orange Free State, S. Africa; exports wool and hides. Pop. 50,000.

HARRISON, BENJAMIN (1833-1901), twenty-third President of the United States. *B.* in North Bend, Ohio, Aug. 20, 1833; *d.* in Indianapolis, Ind., March 13, 1901. He was a great-grandson of Benjamin Harrison who signed the Declaration of Independence and grandson of William Henry Harrison, ninth President of the United States. Graduating from Miami University, Ohio, in 1852 and admitted to the bar in 1853 he practiced law in Indianapolis and in 1861 was elected reporter of the state Supreme Court. In the Civil War he helped recruit, and was colonel of the 70th Indiana Volunteers which formed part of the 20th army corps un-

der Hooker in the campaign from Charleston to Atlanta. He served with distinction at Peach Tree Creek commanding a brigade, and at Nashville, and brevetted brigadier-general, was mustered out in June, 1865. He was defeated running for governor of Indiana in 1876; member of the Mississippi Commission, 1879; chairman of the Indiana Delegation to the Republican National Convention, 1880; senator, 1881-1887; delegate to Republican National Convention, 1884, and in 1888 was nominated for president, receiving in the election 233 electoral votes to 168 for Cleveland. During his administration the McKinley tariff law was passed, the new navy extended, civil service reform advanced, the Pan-American Congress convened, and the Behring Sea fisheries question arbitrated with Great Britain. At the Republican National Convention of 1892 Harrison was renominated, but in the election received only 145 votes to Cleveland's 276. In 1899 he was counsel of Venezuela in the Anglo-Venezuelan Arbitration Commission; member for the United States at the Hague Peace Conference, 1899; and of the Board of Arbitration. Author; 'This Country of Ours', 1897 and 'Views of an Ex-President', 1901.

HARRISON, MRS. BURTON (CONSTANCE CARY) (1843-1920), an American author, *b.* in Vancluse, Va. In 1867 she married Burton N. Harrison, who had been the secretary of the Confederate President, Jefferson Davis, and was captured with him. She was well on into middle age before she began to write, but the many novels she wrote after that acquired a wide popularity. Among them are *Bar Harbor Days*, 1887; *Sweet Bells Out of Tune*, 1893; *A Bachelor Maid*, 1894; *A Princess of the Hills*, 1901; *Recollections, Grave and Gay*, 1911. She also wrote several plays, one of them, *The Unwelcome Mrs. Hatch*, first produced in 1901, being played by road companies for many years after.

HARRISON, FRANCIS BURTON (1873), an American governor-general of the Philippines, *b.* in New York. He graduated from Yale University, in 1895, and from the New York School of Law, in 1897, was admitted to the bar, in 1898, then enlisted as a private in the army for the Spanish-American War, becoming a captain and adjutant-general of Volunteers. He was elected to Congress from New York for the terms 1903-5, 1907-13, was re-elected for 1913-15, but resigned on being appointed Governor-General of the Philippines, in 1913, which position he held till 1921.

HARRISON, FREDERIC (1831-1923), Eng. jurist, Positivist, and critic; *b.* London; educated Oxford, called to bar 1858; prof. of jurisprudence, Inns of Court 1877-89; helped to codify Eng. law; follower of Comte; studied Labour problems; distinguished literary critic and historian, whose writings have a high value among students. Chief works are *Oliver Cromwell* 1888, *Ruskin*, 1902; *Chatham*, 1905; *The Creed of a Layman*, 1907; *Autobiographic Memoirs*, 1911; *Among My Books*, 1912; *The Positive Evolution of Religion*, 1912; *On Society*, 1918; *Obiter Scripta*, 1919. His *s.*, Austin 1873, edited the *English Review* from 1910, and has wrote on Anglo-Ger. questions; he opposed Mr. Lloyd George in Carnarvon Boroughs (Dec. 1918).

HARRISON, (LOVELL) BIRGE (1854); *b.* in Philadelphia, Pa.; pupil in Paris of Cabanel; 1889-1893 painted in the South Seas, Australia and Western United States. In 1887 awarded silver medal at Paris Salon. Buffalo Exposition 1901 a medal. Medal at Chicago Exposition in 1893. Gold medal, Philadelphia, 1907. His paintings in oil are in museums in Marseilles, Paris, France. St. Louis, Chicago, St. Paul, Nashville, Oakland, California, Toledo, Washington, Memphis, Omaha, Atlanta. Director of landscape school of Art Students League, 1910. Member of New York Water Color Club. Society American Artists. Fellow Pennsylvania Academy of Design. Author of 'Landscape Painting', 1909. Writes for Art Magazines.

HARRISON, MARY ST. LEGER (1852), an English novelist who wrote under the pen name of Lucas Malet. She was the youngest *d.* of Charles Kingsley and was *b.* in Eversley. She married William Harrison, who died in 1897. Her novels, which were of unusual literary merit and strength, include *The Counsel of Perfection*, *The Wages of Sin*, *Sir Richard Calmady*, *The Far Horizon*, and *Adrian Savage*.

HARRISON, THOMAS (1606-60); Eng. Roundhead; present at Marston Moor, Naseby, and siege of Oxford; signed king's death warrant; held military command during Cromwell's absence; instrumental in expelling Long Parliament; opposed Cromwell's protectorate; suspected of plots, he was twice imprisoned; executed at Restoration.

HARRISON, WILLIAM HENRY (1773-1841), 9th President of the United States, *b.* in Berkeley, Va. He was about to graduate in medicine when the death of his father caused him to return to his own choice and enter the Army. He saw a great deal of active service

against the Indians, then resigned in 1798 to settle at North Bend, near Cincinnati. He was sent to Congress as the first delegate from the Northwest Territory. Part of this region was marked off as the Territory of Indiana, of which he was appointed first governor, as well as Superintendent of Indian Affairs. After protracted negotiations with the Indians under Tecumseh, he set out, in 1811, with 900 men, to punish them, and severely defeated them in the famous battle of Tippecanoe. During the War of 1812 he was given the rank of major-general and made commander-in-chief of the Northwest. After serving a term in Congress he retired, in 1829. Im 1839 he was nominated candidate for the Presidency by the Whigs and was elected over his adversary, Van Buren, by 294 electoral votes to 60. He only survived his inauguration as President a month.

HARROGATE (54° N., 1° 33′ W.), town, Yorkshire, England; health resort, noted for saline, chalybeate, and sulphur springs. Pop. 35,000.

HARROW, agricultural implement for breaking the soil into fine pieces after it has been ploughed, and for covering the seed sown; chief varieties are the straight-tooth and the spring-tooth.

HARROW-ON-THE-HILL (51° 34′ N., 0° 20′ W.), town, Middlesex, Eng.; famous for school founded by John Lyon, 1571. Pop. 18,000.

HARRY, blind minstrel of Scot. court in latter part of XV. cent.; wrote long epic poem called *William Wallace.*

HARSHA, HARSHAVARDHANA, last native ruler of the whole of N. India 606-648 A.D.

HART, ALBERT BUSHNELL (1854), an American university professor and historical writer, *b.* in Clarksville, Pa. He graduated from Harvard University, in 1880, continued his studies in Germany, then began teaching, specializing in history, being professor of history at Harvard University, since 1897 and professor of government as well since 1910. He has written many magazine articles and books, among the latter being *Introduction to the Study of Federal Government,* 1890; *Foundations of American Foreign Policy,* 1901; *Manual of American History, Diplomacy and Government,* 1908; *The War in Europe,* 1914; *America at War,* 1917; and *Causes of the War,* 1920.

HART, CHARLES (fl. 1660), Eng. actor who played leading parts in Restoration tragedies; grandson of Shakespeare's *s.* Joan; *d.* 1683.

HART, SIR ROBERT (1835-1911), Anglo-Chinese official; entered Consular service, China, 1854; inspector-gen. of Chin. Customs department, 1863; greatly increased revenues; his house, containing valuable official documents, burnt down in Boxer rising, 1900; retired in 1907.

HARTE, FRANCIS BRET (1839-1902), *b.* in Albany, N. Y., in 1839; *d.* in Aldershot, Eng., May 6, 1902. In 1854 he was attracted to California then in the height of the gold excitement. After teaching school for a time and making a failure of gold-mining he became a compositor on the Golden Era, in which his early sketches appeared. Later he joined the Californian wherein his 'Condensed Novels' and parodies were published. Secretary of the U. S. Branch mint in 1864, he became editor of the Overland Monthly in 1868. in whose pages appeared *The Luck of Roaring Camp.* He went to New York in 1871 and wrote stories for the Atlantic Monthly until appointed U. S. consul at Crefeld, Germany in 1878, and at Glasgow in 1880. After 1885 he made his home in London. Notable among his shorter fictions are *Miggles, The Outcasts of Poker Flat* and *M'liis,* 1871; *An Heiress of Red Dog,* 1879; *Flip,* 1882; *A Phyllis of the Sierras,* 1888. Stories: *The Bell Ringer of Angeles,* 1894; *A Problem of Jack Hamlin's,* 1894. Long stories and novels: *Snowbound at Eagles, Cabriel Conroy, Criesy,* 1889; *A Waif of the Plains,* 1890; *A Ward of the Golden Gate,* 1890; *Clarence,* 1895; *In the Hollow of the Hills,* 1895; *Three Partners,* 1897. Poems: *East and West Poems,* 1871; *Echoes of the Foothills,* 1874; *Some Later Verses,* 1898. Bret Harte was at his best in short pieces, he was unequal to long flights. His continued residence in Europe had a weakening effect on later work.

HARTFORD, a city of Connecticut, the capital of the State and the county seat of Hartford co. It is on the New York, New Haven and Hartford railroad, and on the Connecticut River, 36 miles northeast of New Haven. It is an important commercial city and is a port of entry. Hartford is one of the most attractive cities in New England, and is the seat of many important institutions, including Trinity College, Hartford Congregational Theological Seminary, American Asylum for the Deaf, Insane retreat, old people's home, young people's Christian association building. There is a Roman Catholic cathedral and many other handsome churches. The capital is of unusual architectual merit and the city hall is also an attractive building. The latter was used as a

State house for nearly 100 years, and was the meeting place of the famous Hartford Convention. Other historical buildings are Center Church, erected in 1807, the Wadsworth Athenaeum, and the Hartford Public Library and Morgan Memorial. Near the center of the city is a tablet which marks the site of the Charter Oak, a famous tree, in the hollow of which was hidden the Connecticut charter to save it from Sir Edmund Andros, who wished to seize it. The State House is an impressive building erected at a cost of over $3,000,000. The city has great industrial importance. Its manufactures include machinery, tools, firearms, carriages, sewing machines, typewriters, engines, woolen goods, brass goods, etc. It is the greatest insurance center in the United States and is the home office of many of the largest fire, accident and life insurance companies. Hartford was first settled by the Dutch in 1623. This, however, was abandoned and the first permanent settlement was made by the English in 1636. This was called Newton. In 1637 the name was changed to Hartford. The city was incorporated in 1784 and became the State capital in 1873. Pop. 1920, 138,036.

HARTFORD CITY, a city of Indiana, in Blackfoot co., of which it is the county seat. It is on the Pittsburgh, Cincinnati, Chicago and St. Louis, and the Lake Erie and Western railroads. The surrounding country is an extensive natural gas and oil region. There are manufactures of paper, tile, bricks, wagons, glass, etc. Pop. 1920, 6,183.

HARTFORD CONVENTION, a gathering held in 1814 to discuss measures for securing New England interests against the S. and W., especially with regard to the war of 1812. The Federalists opposed the war on several grounds, their chief objection being that it was destroying all American commerce in order to punish Great Britain for crippling a part of it. Thus, all through the war they harassed the government, but by 1814 the destruction of New England industries had become intolerable, and a convention was called. This met at Hartford, and George Cabot, of Massachusetts, was chosen president. Various proposals were made, but before anything definite could be arranged, a satisfactory peace was made, and all disasters were forgotten in the blaze of the battle of Orleans.

HARTINGTON, LORD SPENCER CAMPTON CAVENDISH, MARQUIS. See DEVONSHIRE, DUKE OF.

HARTLEPOOL (54° 42′ N., 1° 11′ W.), seaport, Durhamshire, England; including municipal borough of H. and county borough of West H. H. is an old market town; West H. is modern, with municipal buildings, Athenaeum, exchange, etc.; considered as one port which has large trade; engineering works, shipbuilding, iron and brass foundries, flour and paper mills. Pop. 1921, 21,300; W. Hartlepool, 1921, 68,689.

HARTLEY, DAVID (1705-57), Eng. philosopher, physician, and psychologist; wrote *Observations on Man*; called founder of *Association* school of psychologists.

HARTMANN, KARL ROBERT EDUARD VON (1842-1906), Ger. philosopher; wrote *Philosophy of the Unconscious* 1869 and many other works; a pessimist, but believed that by social progress some happiness might be attained.

HARTMANNSWEILERKOPF, height (3,000 ft.) of S. Vosges, Haute-Alsace, France (47° 53′ N., 7° 8′ E.); was centre of prolonged struggle during World War. Fr. troops reached its W. slopes (Dec. 1914), and a company of Alpine troops captured and established themselves on its summit early in 1915, but were cut off by Ger. force and two-thirds of their number killed. During offensive in Alsace (Jan. 1915) the French again secured summit, and again the detachment was killed or captured. French again returned to charge (March 24) and after severe fighting reached summit (March 27). On April 26 the hill was again the scene of severe fighting. Thereafter neither side held the crest.

HARTFORD THEOLOGICAL SEMINARY, a training school for ministers of the Congregationalist Church, founded in 1834 as the Theological Institute of Connecticut, in East Windsor. In 1865 it was removed to Hartford and its name changed to its present one. It is governed by a Board of Trustees, elected by the Pastoral Union, an association of about two hundred ministers who have subscribed to the creed of the organization.

HARTRANFT, JOHN FREDERICK (1830-1889), an American soldier, *b.* in New Hanover, Pa. After studying law he entered the army and served throughout the Civil War, reaching the rank of major general. He was selected to execute the sentences passed upon the assassins of President Lincoln. From 1872 to 1878 he was governor of Pennsylvania.

HARTSHORN, the horn of the common stag, which in composition differs from that of the ox, etc., being nearly

identical with that of bone. The substances derived from the horns were the volatile liquor, salt, and oil, and the ash which remains when the horns are calcined in air. The fluid parts are got by distillation, and the salt formed is carbonate of ammonia. From this pure ammonia is obtained, which, when condensed in water, constitutes the spirit of H. The volatile alkali, or spirit of H., is now seldom obtained from that source; the ammonia sold in shops being obtained from gas-liquor, etc.

HARTSHORN, SPIRIT OF, the name for a solution of ammonia which used to be obtained from the horns of the stag, and which has now been replaced by carbonate of ammonia or sal-volatile.

HARTT, ROLLIN LYNDE (1869), Writer. *B.* in Ithaca, New York. In 1892 Bachelor of Arts of Williams College and of Andover Theological Seminary, 1896. Was ordained Congregational Minister, 1896. Pastor of churches in Helena, Mont. and Leverett, Mass. 1899-1900 traveled in America gathering material for magazines. On staff of Literary Digest, Boston Transcript and Chicago Tribune. In 1920 did publicity work for Methodist Centenary. Author *The Clerk of the Day, The People at Play, Ruth of the Dolphin, Confessions of a Clergyman* (which he wrote anonymously) author of *As I Was Saying* which ran daily in the New York Tribune. Contributes articles to magazines.

HARUN-EL-RASHID (763-809), V. Abbasid Caliph of Bagdad; famed for the greatness of his empire, the splendour of his court, and his patronage of learning and letters; one the greatest princes of his day;known to Eng.readers from his association with the *Arabian Nights.*

HARUSPICES, ARUSPICES (singular, *Haruspex*), Rom. prophets whose duty it was to explain omens, particularly to inspect entrails of offerings; probably Etruscan practice adopted by Rome.

HARVARD, JOHN (1607-1638), the founder of Harvard University, *b.* in England. After graduating from Cambridge University, in 1635, he emigrated to Massachusetts, of which colony he was made a freeman in 1837. Little is known of his private life, and in the records of the colony a few scraps here and there only indicate public activity, such as the statement that he was one of a commission 'to consider of some things tending toward a body of laws.' At his death his property was valued at £1,600, one half of which he gave to the 'schoale or colledge' which had been established in 1836 but which hitherto had languished on account of lack of funds, and was henceforward called Harvard College, and later Harvard University. He also bequeathed a library of 300 volumes to the institution. A monument was erected to his memory in Charlestown cemetery by the alumni of Harvard College, in 1828, Edward Everett making the official address at the unveiling.

HARVARD OBSERVATORY, an institution for astronomical observation and research, established in 1843, by public subscription, as an annex to Harvard University. A branch station is established on a mountain 8,000 feet in altitude, near Arequipa, Peru. Among its most important instruments are one 15 inch and one 6 inch equatorial telescopes, one 8 inch transit circle, a 11 inch Draper photographic telescope, an 8 inch photographic telescope and a meridian photometer. The annals and records of the institution fill fifty volumes. A special grant was recently made by the Carnegie Institute for a study of the collection of photographs at the main observatory at Harvard. The amount of material, including photographs and photographic charts of the sky that have been collected require a special building for their accommodation. The Sears Tier of the Observatory was added in 1846 and two years later Edward Bromfield Phillips bequeathed the University $100,000 especially for the observatory. It has now an endowment fund of $900,000. Its staff consists of a director, four professors and 40 associates.

HARVARD UNIVERSITY. The oldest educational institution in the United States, founded in Cambridge, Mass. in 1636. In that year the General Court of the colony of Massachusetts Bay voted £400. to found a college to educate 'English and Indian youth'. The first building was erected at New Town, later Cambridge, in 1637. In 1688 a young non-conformist clergyman John Harvard, *d.* at Charleston, and left £750., and his library of 300 books to the college which was named after him. The first president was the Rev. Henry Dunster, and the first graduating class 1642, had nine members. In that year the General Court established a board of overseers consisting of the governor, deputy governor, and magistrates of the colony, and teaching elders of five towns. In 1650 the Court granted a charter; the internal administration including the president, five fellows, and the treasurer. A change came in 1780 when the governor, lieut. governor and council and senate of the Commonwealth of Massa-

chusetts took the place of the colonial officials on the board of overseers. In 1865 the graduates were given the right to elect overseers. Non-residents became eligible as overseers in 1880. The progress of the college was long hampered by religious differences, lack of funds, the burning of Harvard Hall in 1664, and adhesion to the cause of the colonists in the Revolution. In 1782 a medical department with three professors was established and a medical school in 1816; a Law School in 1817, and Divinity School in 1819, the Lawrence Scientific School in 1847, and a Dental School in 1867. The college became a university after Charles W. Eliot (*q.v.*) became president 1869. In 1890 the Graduates School of Arts and Sciences became independent, and in 1906 the Graduates School of Applied Science. University Extension work was started in 1910, Graduates School of Medicine, 1912 and Graduates School of Business Administration 1913. Schools and Departments. Harvard College and the Graduates School, established in 1872. Law, Divinity, and Dental Schools previously mentioned. The Bussey School of Agriculture and Horticulture 1870; The Arnold Arboretum, forestry and arboriculture 1872; Astronomy, 1843; with a branch station on a mountain at Arequipa, Peru; University library of 1,181,635 volumes; the Gray Herbarium, 1864; the University Museum and Botanic Gardens, 1809 and the University Summer School. Twenty-four acres are devoted to athletics and the Stadium seats 30,000. There is also the Harvard Club House, 1901 and Widener Memorial Library, 1915. The invested funds, etc., of the University are about $32,000,000. Annual income of the University 1920, $4,190,666. Students registered in 1922, 6,073. Faculty 957. President A. L. Lowell.

HARVEST (O. E. *hoerfest*, autumn), the period of gathering in crops or fruit; also the crops or fruit so gathered. Religious festivals to celebrate the h. date back to remote times.

HARVEST MOON. See Moon.

HARVESTING MACHINES are mechanical devices for cutting and gathering wheat or similar grains, and binding them into bundles. Some types are equipt to thresh and sack the grain in addition to cutting and gathering it. Probably the first mention of harvesting machines was made by Pliny in 23 A.D. when he described the Gallic 'header'. It was not until 1806 however, when Gladstone proposed a harvesting machine that the attention of inventors was directed to this field of endeavor. Salmon of Woburn in 1807 devised a machine somewhat similar to Gladstone's. Neither of these machines was considered practical and little advance was made before 1822, when Henry Ogle, also an Englishman developed a side draft machine. Progress thereafter was rapid, several models being presented in the following decade. In 1833 Obed Hussey of Md. and C. H. McCormick of Va. presented machines which embodied the side draft feature and vibrating or reciprocating cutters and which may be considered the basis of modern machines. In these however the grain had to be raked off and bound by hand, binding machines not having been developed at this stage. Nelson Platt in 1848 and many others, followed with self raking machines, the grain being left in gavels by the side of the machine. The advent of the binding machine (see Binding Machines) in 1850, in which the sheaves were bound by cord or twine marked the beginning of the development of the modern machine now so widely used in the extensive grain raising areas of the United States and in other countries. These machines, head, thresh, clean and sack the grain in one operation. They are usually drawn by a tractor, which does the work of the 30-40 horses otherwise necessary to draw the machine. Such a machine will harvest 60 to 125 acres of grain per day, doing in 10 minutes what it would take three hours to do manually.

HARVEY, a city of Illinois, in Cook co. It is on the Illinois Central, the Grand Trunk, the Baltimore and Ohio, and other railroads, and on the Calumet River. The city is chiefly a residential suburb of Chicago, It has, however, important industries including the manufacture of mining machinery, gas stoves, automobiles, cement, railroad supplies, etc. There is a public library. Pop. 1920, 9,216.

HARVEY, GABRIEL (*c.* 1545-1630), Eng. poet; wrote sonnets, satires, and controversial pamphlets; was the intimate friend of Spenser; and claimed to have introduced hexameter verse into Eng. lit.

HARVEY, GEORGE BRINTON MACCLELLAN (1864), American editor and diplomat; *b.* Peacham, Vt. He was educated at the Peacham Academy and entered newspaper work as reporter for the Springfield Republican, Chicago News and New York World 1882-86. He was insurance commissioner of New Jersey 1890-91 and from 1891 to 1893 was managing editor of the New York World. He engaged in business as constructor and promotor of electric rail-

roads 1894-98. In 1899 he purchased the North American Review, of which he has since been editor. From 1900 to 1915 he was president of Harper and Bros. Publishing Company. In politics he has been in the main an independent Democrat. He was a warm supporter of Woodrow Wilson for the presidency, but later became antagonistic to him and vigorously attacked his policies. In 1921 he was appointed by President Harding as U. S. Ambassador to Great Britain. He wields a trenchant pen and is a powerful platform speaker. He has never hesitated to express his views, sometimes with a freedom that has provoked surprise and criticism. One such occasion was at the Pilgrims' dinner in London in 1921 when with a vigor and directness unusual for a diplomat he declared that the United States had no intention of becoming a member of the League of Nations. Another utterance of his that attracted wide attention was his statement in 1923 that Lord Balfour had erred in declaring that the United States required Great Britain to guarantee its loans to other Allied Governments. He resigned as Ambassador in Oct., 1923.

HARVEY, WILLIAM (1578-1657), Eng. physician, discoverer of the circulation of the blood; *b.* at Folkestone, *s.* of a yeoman in good circumstances; ed. at the grammar school, Canterbury; at Caius College, Cambridge (B.A., 1597); and at Padua Univ. (M.D., 1602). Returning to England, he commenced to practise medicine in London, becoming a fellow of the Coll. of Physicians 1609, physician to St. Bartholonew's Hospital 1609, and Lumleian lecturer at the Coll. of Physicians 1615. He began to expound his theory of the movements of the heart and the circulation of the blood in his first course of lectures as Lumleian lecturer, but it was not until 1628, when he pub. his treatise, *Exercitatio Anatomica de Motu Cordis et Sanguinis*, that he made his great discovery. See Blood, Circulation of. H. was appointed physician to James I. and to Charles I., having charge of the young royal princes at the battle of Edgehill; he lived at Oxford for some years, being elected warden of Merton College, but on the surrender of the city to the Parliamentarians he returned to London to live in retirement. He was elected pres. of the Coll. of Physicians 1654, but declined the position, and *d.* after being long affected by gout, in London.

HARWICH (51° 51′ N., 1° 17′ E.), port, Essex, England; packet station for Holland; fine harbour and docks; large export and import trade; strongly fortified. Pop. 1921, 13,036.

HARVEYIZED STEEL. See Iron and Steel.

HARZ MOUNTAINS (51° 41′ N.; 10° 37′ E.), a mountain range of N.W. Germany, extending through part of Prussia, Brunswick, and Anhalt, between Leine and Saale; divided into Ober, Unter, and Vorharz; highest peak, Brocken (*q.v.*), 3,745 ft.; length, 57 miles; breadth, 20, and area, 784 sq. miles; rich in iron, copper, lead, silver, sulphur, zinc, granite, marble; large fir and pine forests; numerous mineral springs; figures prominently in Ger. legend and lit.

HASA EL. See El Hasa.

HASDRUBAL (slain 221 B.C.), succ. his f.-in-law, Hamilcar Barca, as leader of the Carthaginians. Hasdrubal, Hamilcar's younger *s.*, aided his *b.* Hannibal in the Punic Wars against Rome.

HASHISH, OR HASHEESH, the Arabic name, meaning literally 'dried herb', for the various preparations obtained from the flowering tops of the Indian hemp plant (*Cannabis indica*). It is used as an intoxicant in several Eastern countries (called 'bhang' in India), and is either smoked, chewed, or drunk. It is valuable as a narcotic and is sometimes employed in medicine as an anodyne. The English word 'assassin' is probably derived from the Arabic 'hashishin,' *i.e.* hemp-eaters, who committed great excesses when under the influence of hashish.

HASLINGDEN (53° 43′ N., 2° 20′ W.), town, Lancashire, England. Pop. 1921, 13,485.

HASPE (51° 20′ N., 7° 20′ E.), town Westphalia, Prussia; industries—iron-founding, iron, steel, and hardware. Pop. 25,000.

HASSAM, CHILDE (1859), an American artist, *b.* in Boston, Mass. After a common school education he studied art, first in Boston, then in Paris. His work, both in painting and etching, is represented in many foreign galleries, and in the permanent collections of the Pennsylvania Academy of Fine Arts, the Carnegie Institute, in Pittsburgh, Pa., the Boston Arts Club, the Corcoran Gallery, in Washington, D. C. and the Metropolitan Museum of Art.

HASSAN (13° N., 76° 7′ E.), town, Mysore, India. Pop. *c.* 9000. District has area of 2,546 sq. miles; produces coffee, cereals. Pop. *c.* 569,000.

HASSE, JOHANN ADOLPH (1699-1783), Ger. composer; very popular in XVIII. cent.; composed innumerable

operas, besides symphonies, masses, etc. with genuine pleasing melodies.

HASSELT (51° 56′ N., 5° 20′ E.), town, Limburg, Belgium. Pop. 17,000.

HASSENPFLUG, HANS DANIEL LUDWIG FRIEDRICH (1795-1862), Ger. politician; held state offices in Hesse-Cassel, 1832-37; in Hohenzollern Sigmaringen, 1838; Luxembourg, 1839; Prussia, 1841-50; head of Hesse government, 1850.

HASTINAPUR, capital of the Pandavas in the Hindu epic, *Mahabharata*; traces *c.* 20 miles N.E. of Meerut, United Provinces, India.

HASTINGS—(1) (50° 52′ N., 0° 36′ E.), municipal, parliamentary, and county borough, Sussex, England; fashionable watering-place and one of Cinque Ports. Small shipbuilding and fishing industry. Site of battle of H. 1066 is 6 miles inland. Pop. 1921, 66,496.

HASTINGS, a city of Michigan, in Barry co., of which it is the county seat. It is on the Michigan Central and the Chicago, Kalamazoo and Saginaw railroads, and on the Thornapple river. It is an important industrial city and has manufactures of cigars, flour, pumps, carriages, wagons, etc. There is a public library and a city hall. Pop. 1920, 5,132.

HASTINGS, a city of Nebraska, in Adams co. It is on the Burlington, the Chicago and Northwestern, the Missouri Pacific, and other railroads. It is the center of an important grain growing region and its industries include foundries, flour mills, and vinegar works. It is the seat of Hastings College, Chronic Insane Asylum, Bethany Home and Hospital, and the Mary Lanning Hospital. It has a public library and a high school. Pop. 1920, 11,647.

HASTINGS-UPON-HUDSON, a village of New York, in Westchester co. Although it is chiefly a residential suburb of New York City it has important industries including the manufacture of copper wire cable, copper, brass, dyestuffs, chemicals, etc. Pop. 1920, 5,526.

HASTINGS, Eng. family; descended from Sir Henry de H. *d.* 1268, supporter of Montfort. Family held H. barony from *c.* 1290; earldom of Pembroke, 1339-89; extinct in XVI. cent. Barony is now held by Astley family. Another branch of family became barons, 1461; Earls of Huntingdon, 1529.

HASTINGS, FRANCIS RAWDON, 1ST MARQUESS OF HASTINGS (1754-1826), Brit. soldier and administrator; served in Amer. War, 1775-82; gained victory at Hobkirk's Hill; led force to assist Duke of York in Flanders, 1794; master general of ordnance, 1806; Gov.-Gen. of Bengal and commander-in-chief in India, 1812; defeated Gurkhas; extended Brit. territories, 1816; crushed Pindaris and Mahrattas, 1817-18.

HASTINGS, THOMAS (1860), Architect. *B.* in New York. In 1884 graduated from Ecole des Beaux Arts, Paris. Partner of John M. Carrere in firm of Carrere and Hastings since 1884. Firm were architects of many famous buildings including New York Public Library, Ponce de Leon and Alcazar Hotels at St. Augustine, Florida and the National Academy of Design. In 1907, member of Commission of Fine Arts. Member of American Academy of Arts and Letters. Was president of Society Beaux Arts Architectes. Chevalier of Legion of Honor, France.

HASTINGS, WARREN (1732-1818), Brit. administrator; *b.* at Churchill, Oxfordshire; entered East India Companys' service, 1750; resident at court of Murshidabad, 1758; member of council, 1761; second in council at Madras, 1768; pres. of council and Gov. of Bengal, 1772. H. effected reforms in system of government; transferred centre of administration from Murshidabad to Calcutta; reformed military and police organisation.

The consolidation of Ind. Empire was largely due to his administrative genius. He became Gov.-Gen. of India, 1773. Members of council were inimical to him, and condemned all his measures. He was accused by Brahmin Nuncomar of receiving bribes; shortly afterwards Nuncomar was accused of forgery, found guilty, and hanged, a circumstance tending to alienate public sympathy from H. During these events H. sent in his resignation, but subsequently remained in office. Between 1777 and 1785 he conducted war against Mahrattas and against Hyder Ali; suppressed insurrection of Chait Sing, Rajah of Benares, and deposed him; caused begums of Oude to give up land and treasure, 1780, some of which he afterwards restored. He returned to England in 1785, and was impeached by Burke in a famous speech, 1786, for oppression, maladministration, and corruption. Trial lasted seven years, after which he was acquitted, 1795. Costs of trial swallowed up his entire fortune, but he subsequently obtained pension from East India Co.

HAT, name given to head-covering, with brim, the principal materials used being silk, fur, wool, merino, straw. The

frame of a silk h. is composed of calico and other materials, stiffened in shellac, and is shaped on a block. The crown and brim are then sewn on, the silk covering and trimmings added, and the finished article is then polished for wear. Opera hats are covered with silk or merino, and a collapsible steel frame provides means of adjustment. Felt hats are made from fur, fur and wool, or wool alone, according to quality. See COSTUME.

HATCH, to incubate from eggs; to develop a hidden scheme; term used by surveyors for shading, and by engravers for similar lines; lower part of divided door.

HATCHMENT, diamond-shaped panel, enclosing arms of a deceased person, suspended on wall of his dwelling for short period after death.

HATHAWAY, ANNE. See SHAKESPEARE, WILLIAM.

HATHOR. See EGYPT (*Ancient Religion*).

HATHRAS (27° 36′ N., 78° 11′ E.), town, United Provinces, Brit. India. Pop. *c.* 43,000.

HATTERAS, CAPE, a low extent of land, in North Carolina, forming part of a sandbank. Here the coast line turns from north east to due north. Severe storms are frequent here and navigation is dangerous at times. At the point of the Cape is a lighthouse, 190 feet above the sea.

HATTIESBURG, a city of Mississippi, in Forrest co. of which it is the county seat. It is on the New Orleans and Northwestern, the New Orleans, Mobile and Chicago, the Missouri Central and other railroads, and on the Leaf River. It is the center of an extensive lumbering region and its other industries include railroad shops. woodworking shops, machine shops, fertilizer factories, etc. It is the seat of the Baptist Women's College. Pop. 1920, 13,270.

HATTO I. (*c.* 850-913), bp. of Mainz; alleged to have been eaten at Bingen (where the Mouse Tower is still shown) by rats as a punishment for his cruelty.

HATTON, SIR CHRISTOPHER (1540-91), Eng. lord chancellor; held various positions under Elizabeth; denounced Mary, Queen of Scots, in Parliament, 1587; Lord Chancellor, 1587; was favorite of Elizabeth; encouraged literature.

HAUFF, WILHELM (1802-27), Ger. poet and novelist; *b.* Stuttgart; best works: *Lichtenstein* (novel), *Phantasien im Bremer Rathskeller*; *Reiter's Morgengesang* (poems).

HAUGWITZ, CHRISTIAN AUGUST HEINRICH KURT (1752-1831), Pruss. politician; ambassador to Vienna, 1792; entered Berlin cabinet, 1792; began negotiations resulting in treaty between Britain and Prussia, 1794; influenced treaty with France, 1795; as Foreign Minister signed treaty of Schönbrunn, 1805.

HAUNTING by spirits of the dead has been observed or credited in all ages. Until recently belief in ghosts was generally discredited, but owing to 'Psychical Research' and elaborate investigation of various phenomena many people believe there is some foundation for ghost stories in fact; possibly mysterious experiences are due only to telepathic suggestion.

HAUPT, LOUIS MUHLENBERG (1844), an American civil engineer, *b.* in Gettysburg, Pa. He graduated from the United States Military Academy in 1867. After several years of service in the army he resigned to become engineer of Fairmount Park, Phila. He was professor of civil engineering at the University of Pennsylvania, from 1872 to 1892, when he resigned to engage in private practice. He was a member of the Nicaragua Canal Commission and of the Isthmian Canal Commission, and was chief and consulting engineer for many important projects including several ship canals. He was the author of many books on engineering and kindred subjects and invented several devices for reclaiming land.

HAUPT, PAUL (1858), an American Orientalist, *b.* at Gorlitz, Germany. He was educated at the University of Leipzig and Berlin. For several years he was professor of Assyriology at the University of Göttingen. In 1883 he was chosen professor of Semitic languages and director of Oriental Semitic at Johns Hopkins University. He wrote much on Oriental subjects and was editor of the Polychrome Bible, and other editions of the Hebrew texts.

HAUPTMANN, GERHART (1862), Ger. poet and dramatist; his works include historical and realistic dramas and comedies; *Einsame Menschen* was his first real success, 1891; *Die Weber* 1892 is a study of conditions of life among hand-weavers of Silesian mountains; *Und Pippa tanzt* is a masterly fairy tale. Most successful when he turns to field of legend and simple child-life. He received Nobel Prize for literature, 1912.

HAUSAS, HOUSSAS, African race inhabiting W. Africa between Lake Tchad and the river Niger; busy traders; language spoken by over 15,000,000 people.

HAUSEN, MAX VON (1846), Ger. soldier, of royal Saxon birth, entered a Saxon Jager battalion and served in wars of 1866 and 1870-1. At outbreak of World War he was placed in command of 3rd Ger. Army. Pub. *Errinnerungen an der Marnefeldzug* 1914, 1920.

HAUSER, KASPAR (1812-33), mysterious youth appeared in Nuremberg, 1828, who could give no account of himself, and possessed no memory of his previous life. A letter in his possession stated that he was born in 1912. Earl Stanhope, and others, took charge of him, and he *d.* from a wound in his breast (December, 1833). Nothing was discovered as to his origin.

HAUTBOY. See Oboe.

HAUSSMANN, GEORGES EUGÉNE BARON (1809-91), Fr. administrator; as Préfet de la Seine 1853-69 greatly embellished Paris, by planning and opening new streets and boulevards.

HAUTE-GARONNE (43° 20′ N., 1° E.), S. W. department, France; area, 2,457 sq. miles; crossed by Garonne produces timber, cereals, wine, fruit; chief town, Toulouse. Pop. 430,000.

HAUTE-LOIRE (45° 10′ N., 3° 50′ E.), department, central France; area, 1,930 sq. miles; surface mountainous; crossed by Loire; coal, timber, cereals, lace; chief town, Le Puy. Pop. 300,000.

HAUTE-MARNE (48° 10′ N., 5° 10′ E.), N. E. department, France; area, *c.* 2,420 sq. miles; surface slopes upwards from N. to S., where is plateau of Langres; crossed by Marne; cereals, vegetables, wine, iron; chief town, Chaumont. Pop. 215,000.

HAUTES-ALPES (44° 40′ N., 6° 20′ E.), S.E. department, France; area, 2,178 sq. miles; drained by Durance; sheep raised; chief town, Gap. Pop. 100,000.

HAUTE-SAÔNE (47° 40′ N., 6° 10′ E.), E. department, France; area, 2,074 sq. miles; crossed by Saône; nearly half surface under cultivation; produces cereals, cherries; iron, steel. and copper works, cotton manufacture; chief town, Vesoul. Pop. 255,000.

HAUTE-SAVOIE (46° N., 6° 25′ E.), E. department, France; area, 1,774 sq. miles, mountainous; beautiful scenery; produces wine; chief town, Annecy. Pop. 255,000.

HAUTES-PYRÉNÉES (43° N., 0° 10′ E.), department, S.W. France; bounded S. by Spain, W. by Basses-Pyrénées, N. by Gers, E. by Haute-Garonne. Chief towns, Tarbes, Lourdes, and Bagnères-de-Bigorre; principal rivers, Gave de Paw, Adour, and Neste. In N. are plains and hills, and in S. Fr. Pyrenees. Cattle- and sheep-rearing, horse-breeding, fruit-growing, and wine-making carried on. Pop. 205,000.

HAUTE-VIENNE (45° 50′ N., 1° 15′ E.), central department, France; area, 2,119 sq. miles; crossed by Vienne, Isle; produces fruits, cereals, porcelain; chief town, Limoges. Pop. 383,000.

HAÜY, RENÉ JUST (1742-1822), a French physicist and mineralogist, *b.* at St. Just, educated at the colleges of Navarre and Lemoine, and became a teacher at the latter. In 1781 he discovered the geometrical law of crystallisation associated with his name, which he afterwards expounded in his *Traite de Mineralogie*, 1801. For this he was elected to the Academy of Sciences in 1783. In 1794 he became curator in the School of Mines, and in 1802 professor of mineralogy at the Museum of Natural History. He suffered considerably during the Revolution. He also made valuable observations in pyro-electricity. His other works include *Traite elementaire de Physique*, 1803, and *Traite de Cristallographie*, 1822.

HAVANA, OR HABANA, cap. and seapt. of Cuba (23° 6′ N., 82° 25′ W.), situated on N. side of island; chief commercial city of W. Indies. Havana consists of old or inner town, with narrow, dirty streets, and well-laid-out new part, with beautiful promenades and gardens. Notable features are the old Spanish cathedral 1724, governor's and bishop's palaces, admiralty, State univ., library, museum, theatres, arsenal, bull-ring, and splendid harbour with strong fortifications (Punto and Morro castles, Cabanas fort, etc.); chief industries; famous Havana cigars, sugar, chocolate, coffee, rum, molasses woollen fabrics and straw hats.

Founded by Diego Velasquez on S. coast 1515, and removed to present position, 1519; captured by French, 1563, by English 1762, and restored 1763. In 17th cent. chief naval station of Span. W. Indies fleet; blockaded by Amer. fleet 1898, and made independent 1902. Pop. 360,000.

HAVEL (52° 43′ N., 12° 11′ E.); river, Prussia, Germany; unites with Elbe above Wittenberge.

HAVELOCK, SIR HENRY (1795-1857), Brit. soldier; served in Burma,

1825-26; Afghan wars, 1839; distinguished in Mahratta and Sikh campaigns, 1843, 1845; commanded division in Persia, 1857; sent to India during Mutiny; defeated rebels at Fatehpur, Cawnpore, and other places; relieved Lucknow, 1857.

HAVELOK, THE DANE, hero of Anglo-Scandinavian romance, *s.* of Birkbagen, king of Denmark, who, by treachery, was set adrift on raft, which bore him to the Lincolnshire coast. He was befriended by a fisherman, Grim; subsequently m. a distressed Eng. princess, and became king of Denmark and part of England; Eng. versions of Middle Eng. poem by Skeat and others.

HAVERFORD COLLEGE, an educational institution founded by the Society of Friends in Haverford, Pa., in 1833, and being the first establishment of the kind to come under their auspices. Its buildings, numbering 17, and the grounds, cover 226 acres, and are valued at about $2,000,000. In 1922 the faculty numbered 22 and the students 225.

HAVERGAL, FRANCES RIDLEY (1836-79), an English poetess, *b.* at Astley, Worcestershire, *d.* of the Rev. William Henry H. She was a talented child, and began to write verses at the age of seven. Her best work is religious, and is characterised by graceful expression, sympathetic feeling, and introspective insight. Many of her hymns are well established favourites, and are included in numeros collections for use in churches. Her works, originally published as *Ministry of Song*, 1870; *Under the Surface*, 1874; *Loyal Responses*, 1878; were collected in 1884 by her sister, who, in 1880, had published *Memorials of Frances Ridley Havergal.*

HAVERHILL, a city of Massachusetts, in Essex co. It is on the Boston and Maine Railroad, and on the Merrimac River, 33 miles N. of Boston. It is an important manufacturing city and among its industries are plants for the making of boots and shoes, hats, cotton and woolen goods, leather, lumber and brick. It is also the center of an extensive farming and dairying district. There are many notable public buildings, four national banks, an excellent system of streets and sewers, and electric railways. The city was originally an Indian village called Pentucket, and was settled in 1640. It was incorporated in 1645 and was chartered as a city in 1869. Haverhill was the birthplace of John Greenlief Whittier and was his home for many years. Pop. 1920, 53,884.

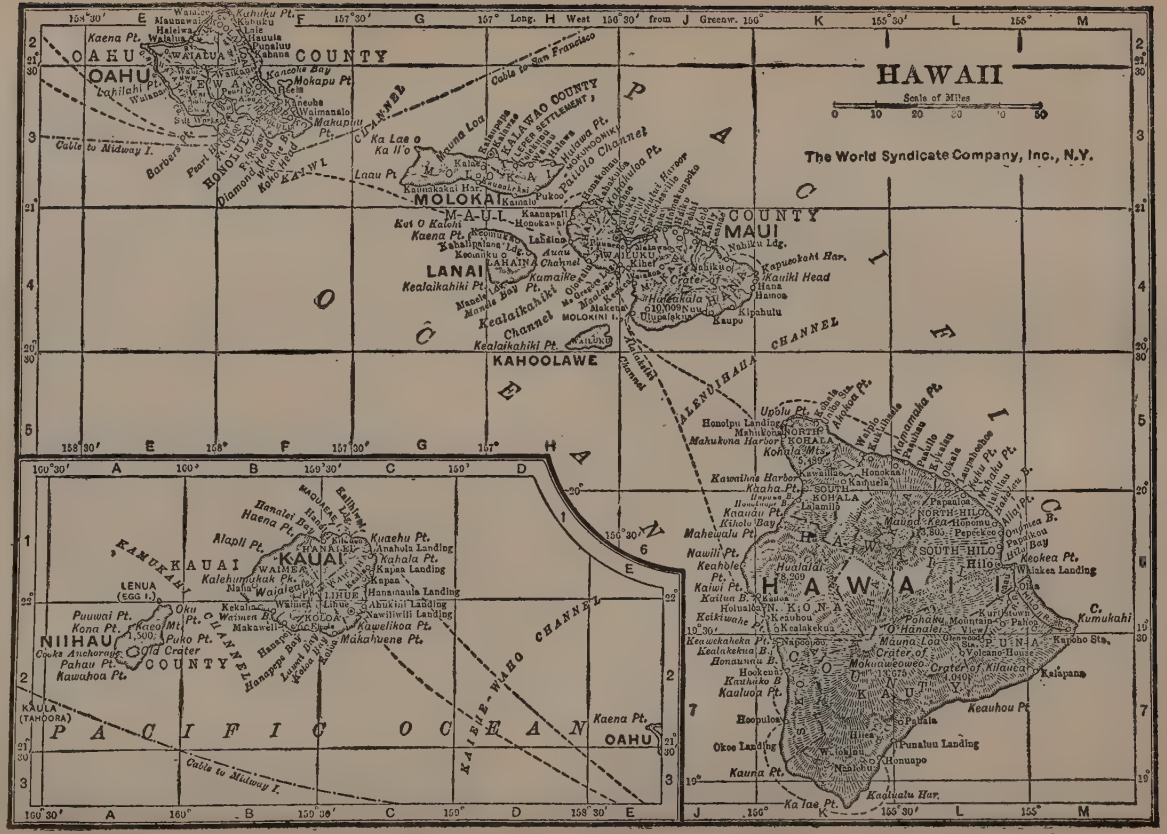
HAVERSACK, canvas bag to strap on shoulders; originally receptacle for oats (*haver*), which were the usual fare of soldiers on the march.

HAVERSTRAW, a city of New York, in Rockland co., formerly known as Warren. It is on the West Shore and the New York Ontario and Western railroads, and on the Hudson River. It is notable for being the largest brick manufacturing city in the world. Its other industries include the manufacture of brick-making machinery, dynamite and baskets. In the vicinity are many points of historic interest. The city has parks, street railways, daily and weekly newspapers, and a national bank. Pop. 1920, 25,669.

HAVRE, OR LE HAVRE DE GRÂCE, second greatest seaport of France (49° 29′ N., 0° 6′ E.), in Seine-Inférieure, on estuary of Seine; first-class fortress, with church of Notre-Dame, town hall, museum, marine arsenal, etc., large shipbuilding yards, cannon foundries; machinery, glassware, lace, cotton goods, etc. During World War vast numbers of troops for various fronts disembarked here. Pop. 1921, 163,374.

HAWAII, OR THE HAWAIIAN ISLANDS are situated in the North Pacific. They were formerly known as the Sandwich islands, and have been American territory since 1898. Their latitutde is from 19° 54′ to 22° 15′ N., and their longitude 154° 50′ to 160° 30′ W. They thus extend N.W. to S.E. for about 390 miles on the northern edge of the tropics. The islands serve as the crossroads of the Pacific, as they are more than 2,000 miles from the nearest mainland. They are 2,089 miles from San Francisco, 4,680 miles from Panama, 3,800 from Manila, and 4,950 miles from Hong Kong. The area of the territory is 6,449 square miles and comprises twenty islands, of which nine are inhabited, the latter being the main island, Hawaii, 4,016 square miles, Maui, 728; Oahu, 598; Kauai, 547; Mokokai, 261; Lanai, 140; Niihau, 73; Kahoolawe, 44; and Molokini, 2.7 square miles. The island of Hawaii, by which the group is commonly designated, constitutes nearly two-thirds of the entire territory, but Oahu, on which the Hawaiian capital, Honolulu, is situated, is the more important island.

These two islands and Maui contain large areas of fertile plains and valleys between the mountains and the coasts. All the islands are mountainous and of volcanic origin. Like other Pacific islands, they form the summits of towering volcanic masses projected up from the sea bed, with steep and rocky coasts and precipices extending several miles. Hawaii island has the loftiest peaks.


HAWAII
Scale of Miles
0 10 20 30 40 50
The World Syndicate Company, Inc., N.Y.
OAHU COUNTY
OAHU
MAUI COUNTY
MAUI
KAUAI COUNTY
KAUAI
NIIHAU
COUNTY
KAHOOLAWE
LANAI
MOLOKAI
M-A-U-I
HAWAII
PACIFIC OCEAN
KAIEIE-WAHO CHANNEL
KAULAKAHAI CHANNEL
KALOHI CHANNEL
PAILOLO CHANNEL
KAIWI CHANNEL
Cable to San Francisco
Cable to Midway I.
Cable to Midway I.
Honolulu
Pearl Harbor
Barbers Pt.
Diamond Head
Koko Head
Kaena Pt.
Waialua
Haleiwa
Waimea
Nawiliwili Harbor
Hanalei Bay
Kilauea Pt.
Kahala Pt.
Alapii Pt.
Kekaha
Kalepa
Kapaa
Hanamaulu
Lihue
Kekaha
Waimea B.
Waimea
Kekaha
Makaweli
Waiawa
Koloa
Kawelikoa Pt.
Makahuena Pt.
Kaena Pt.
Kawaihoa Pt.
Kaula (Tahoora)
Kaula Anchorage
Gold Crater
Puuwai Pt.
Kona Pt.
Keoo Mt.
1,300
Puko Pt.
Pahau Pt.
Kawahoa Pt.
Lenua (Egg I.)
Oku Pt.
Kaena Pt.
Waialua
Kahuku Pt.
Kawela Bay
Kaloko
Kaiaka Bay
Waialua
Haleiwa
Waimea
Kawailoa
Waimea B.
Kamooko Bay
Mokapu Pt.
Kaneohe
Waimanalo
Makapuu Pt.
Ka Lae o Ka Il'o
Mauna Loa
Kalaupapa
Waialeia
Kalawao
Kauhakoa
Kauhako Crater
Kaluaaha
Pelekunu
Waikolu
Waialeia
Kamalo
Laau Pt.
Kaunakakai Harbor
Kamalo
Pukoo
Honouliuli
Waianae
Waianae Kai
Waianae Valley
Kaena Pt.
Kaena Pt.
Waialua
Kaena Pt.
Waialua
Kaena Pt.
Kaena Pt.
Kaena Pt.

Mauna Kea and Mauna Loa, 13,085 and 13,650 feet high respectively. Mauna Loa is an active volcano at times and contains on its eastern slope the famous Kilauea crater, about nine miles in diameter, which is in frequent eruption and the largest active volcano in the world. A much larger but extinct crater, measuring from 20 to 30 miles in circumference, is Haleakala (House of the Sun), rising more than 10,000 feet above sea level on the island of Maui. Where the land does not rise up sheer, there are occasional sandy beaches, and, more frequently, coral reefs. The islands have no waterways that can be called rivers. The mountains pour down torrential streams, but the watercourses formed are short and quite unnavigable, though useful for irrigation.

The islands came into the possession of the United States as the outcome of a growth of American interests there extending from the beginning of the nineteenth century. They were discovered by Captain Cook in 1778. After the American revolution the Sandwich Islands, as they were then known, were frequently visited by Yankee trading craft and became their chief center in the Pacific. The work of American missionaries and the appointment by President Monroe of an American agent of commerce and shipping increased the connection between the two countries, and American settlers came. The United States had a military force on the islands to protect American commerce, and to check desertions and mutinies by seamen on whalers and other ships, and in 1825 a small naval force was sent. Later there were occasional negotiations between the United States and the Hawaiian monarchy for the improvement of the relations between the two countries in view of growing commercial interests and the need of protecting American rights. The U. S. government also sought to oppose interference with the island's independence by foreign powers. This policy was induced in 1843 by the action of a British naval commander, who occupied the islands and demanded that Hawaii declare her allegiance to Great Britain. The British government repudiated his action and later Great Britain and France undertook not to seek control of the islands even under a protectorate.

Steps towards American annexation began as early as 1851, when the Hawaiian government provisionally ceded the islands to the United States to checkmate feared French designs. The United States refused to take them, but its navy kept a fleet handy for Pacific service. Three years later a treaty was drafted admitting the islands as a state of the American Union, but was not proceeded with. A reciprocity treaty signed in 1867 promised an expansion of American influence, but was rejected by the Senate. From that year onward annexation of the islands intermittently occupied succeeding American Secretaries of State with periodic soundings of the Hawaiian government on the subject. In 1875 the United States by another treaty obtained certain exclusive trade privileges in the islands; in 1884 it obtained the right to enter Pearl Harbor and establish a coaling station. Finally, in 1893 an annexation treaty was signed with a provisional government which was established following the deposition of Queen Liliuo Kalani. This step was the outcome of a revolution headed by an American, Sanford Ballard Dole (*q. v.*) a judge of the Hawaiian Supreme Court. President Harrison sent the treaty to the Senate, but President Cleveland withdrew it in order to examine the whole situation. Any lingering doubts as to the expediency of annexing the islands were dispelled by the action of Germany and other powers in annexing other Pacific islands. The republic formed by Dole and his followers wanted union. The Spanish-American war of 1898, which brought the Philippines and other islands within American territory led both houses of Congress, on July 7 of that year to a joint resolution by large majorities annexing the islands, which in 1900 were organized as a Territory and admitted into the Union.

Sugar, pineapples, rice and coffee form the island's leading products. The largest industry is the production of sugar, which in 1919 extended over plantations—mostly irrigated land-aggregating 123,165 acres, and had a value of $80,236,000. The growing and canning of pineapples produced in 1920 nearly 144,000,000 cans (each of two pounds) valued at $31,000,000. Rice yielded a crop of 29,571,845 pounds in 1919, and coffee 10,883 650 pounds. The United States gets most of the island's products and sends in return manufactured goods, food products and general merchandise and commodities in large volume. The total exports to the United States in 1921-22 had a value of $68 335,070 and the imports $51,581,621, both a considerable falling off from the value of trade done the fiscal years immediately previous.

The farms in 1920 covered 2,702,245 acres, of which 435,242 were improved and 599,531 woodland, and had a value of $151,129,085. There were 5,284 farmers, of whom 892 were white, 679 Hawaiian, 3,098 Japanese and 560 Chinese. Most of the farms were owned by the occu-

pants, except those of the Japanese and Chinese. Of the 3,098 Japanese farms, there were 188 owners, 11 managers and 2,899 tenants; the 560 farms had 56 owners, 7 managers and 497 tenants.

The U. S. government maintains a considerable army on the islands. As to their revenue, it is chiefly derived, as in the States, from taxing real and personal property. The federal government's share in the island's productiveness is shown in the custom receipts, income and other taxes, which yield about $25,000,000 annually for Washington. At Pearl Harbor, on Oahu, the U. S. navy has a large base as well as an aviation field and powerful radio station. The governor of the islands under the Harding administration 1921-4 was Wallace R. Farrington.

The population in 1920 was 255,912, of which 109,274 were Japanese, and only 41,750 were Hawaiian or part Hawaiian. Thd rest were Portuguese, 27,002, Americans and other Caucasian races, 19,708, Filipinos 21,031, and Porto Ricans, Spaniards, Koreans and negroes. The two chief cities are Honolulu, the capital, with a population, 1920 of 83,237 and Hilo, on Hawaii island, which had 10,431 people in that year.

HAWARDEN (53° 11′ N., 3° 1′ W.), town, Flint, N. Wales. Hawarden Castle was Gladstone's seat. Pop. 27,000.

HAWES, STEPHEN (*d. c.* 1523), Eng. poet; Groom of the Chamber to Henry VIII.; his works include *Pastyme of Pleasure*, 1509; *Convercyon of Swerers*, 1509; *The Exemple of Vertu*, 1512, etc. His works contributed to the formation of the Eng. literary language.

HAWICK (55° 26′ N., 2° 48′ W.), burgh, Roxburghshire, Scotland, on both sides of Teviot; chief manufacturing town in S. Scotland. district rich in historic houses. Pop. 1921, 16,353.

HAWK FAMILY (FALCONIDÆ), a large family of diurnal birds of prey (*Accipitrines*), comprising nearly 500 species found all the world over. They are distinguished from other birds of prey by the presence of a voice-box at base of windpipe, of a circlet of feathers surrounding the oil gland, of an aftershaft on the feathers, and by their feathered heads. The following are a few of the many types belonging to the Hawk family: the New World Caracaras (*Polyborinœ*) feed on living prey or on carrion, run rapidly, and nest on the ground. They differ from all other Hawks in having three toes instead of two, connected by a web. Long-legged Hawks, with the lower leg-joint or metatarsus at least equal to that above it, the tibia, form the group *Accipitrinœ*, found in all lands.

HAWKE, EDWARD, BARON HAWKE (1705-81), Brit. admiral; *b.* London; entered navy at an early age and became commander when twenty-eight; served against Spain in W. Indies; rendered good service at Toulon, 1744; in 1747, off Belleisle, and in 1759, in Quiberon Bay, he inflicted ruinous defeats on Fr. fleets; also led an unsuccessful expedition against Rochefort in 1757; Admiral of the Fleet, 1768; First Lord of Admiralty, 1766-71; cr. peer, 1776.

HAWKER (*Hawker*, XVI. cent.), itenerant vendor.

HAWKER, HARRY GEORGE (1881), Australian airman of Cornish origin; took pilot's certificate at Brooklands, 1911; won Michelin prize, 1912; took part in *Daily Mail* 'Round Britain' competition, 1913. During the World War was engaged in testing machines for Sopwith Co. Made new world's record for height at Brooklands, 1916. In June, 1919, with Commander Mackenzie Grieve, attempted to fly across Atlantic, but engine trouble compelled their descent in mid-ocean.

HAWKESWORTH, JOHN (*d.* 1773), Eng. writer; edit. Captain Cook's *Journals*, 1773; edit. Swift, and pub. much miscellaneous work.

HAWKINS, ANTHONY HOPE pseudonym Anthony Hope (1863), Eng. novelist; has achieved distinction in the romantic style with *The Prisoner of Zenda*, 1894; and in light modern comedy with *The Dolly Dialogues* and similar works; his later books have been comedies of a more serious character, and include such novels as *The God in the Car, Quisante, Tristram of Blent*, etc.; his most recent works are *Captain Dieppe*, 1918 and *Beaumaroy home from the Wars*, 1919; author of several plays: *The Prisoner of Zenda* has been successfully dramatized.

HAWKINS, SIR JOHN (1532-95), Eng. admiral; engaged in slave trade; defeated by Spanish, 1567; treasurer of navy, 1572; rear-admiral, 1588; fought against Armada; *d.* on voyage to West Indies.

HAWKINS, SIR RICHARD (1562-1622), Eng. admiral; *s.* of Sir John H.; commanded *Duck* galliot in Drake's raid on Span. Main, 1585; captain of *Swallow* in attack on Great Armada, 1588; sailed in the *Dainty* for the Pacific, 1593; plundered Valparaiso, and, in San Mateo Bay, kept up a three days' fight with two Span. galleons; finally capitulated, and

was for ten years prisoner; subsequently ransomed; knighted by James I., and made vice-admiral of Devon.

HAWKWOOD, SIR JOHN L'ACUTO (*d.* 1394), Eng. soldier-of-fortune; served under Black Prince in France; afterwards fought as mercenary in Italy, assisting Pisa against Florence, Milan against pope, pope against Milan, and finally entered Florentine service, 1378; see RUSKIN'S FORS CLAVIGERA.

HAWTHORN (37° 49′ S., 145° E.), town, Victoria, Australia. Pop. 22,000.

HAWTHORN, a tree, *Cratoegus oxyacantha*, natural order *Rosaceoe*, suborder *Pomeoe*, with *polypetalous* white or red flowers and numerous *stamens* in whorls; the *stigma* ripens first, but *self-pollimation* is possible. The fruit is a *pome*, the *carpels* of which are stony. H's are commonly used for hedges and for ornamental purposes.

HAWTHORNE, HILDEGARDE, an American author, *b.* in New York. She received a private education, at home and abroad, after which she began her literary work, contributing articles, poems and short stories to the magazines. For many years she has been a book reviewer on the New York Times. Among her books are *A Country Interlude*, 1904; *The Lure of the Garden*, 1911; *Old Seaport Towns of New England*, 1916; *Rambles Through College Towns*, 1917 and *Girls in Bookland*, 1917.

HAWTHORNE, JULIAN (1846), an American writer and the *s.* of Nathaniel Hawthorne, *b.* in Boston, Mass. He graduated from Harvard University, in 1867, then studied engineering in Germany. For a while he held a position in the Department of Docks in New York City, but after 1872 began writing. Among his books are *Bressant*, 1872; *Garth*, 1875; *American Literature*, 1891; *Hawthorne and His Circle*, 1903, and *The Subterranean Brotherhood*, the latter written after his imprisonment, in 1914, and based on his experiences in the penitentiary.

HAWTHORNE, NATHANIEL (1804-1864), American novelist. *B.* in Salem, Mass., July 4, 1804; *d.* in Plymouth, New Hamp., May 18, 1864. He came of stern Puritan ancestry circumstance that colored his literary work. Graduating from Bowdoin College in 1829, *Fanshawe* was published anonymously in 1828. He first signed his name to *Four Tales* which appeared in The Token. The first volume of *Twice Told Tales* came out in 1873. So little was he read, that he took the position of weigher at the Port of Boston 1839-1841, being dismissed when a new party came in power. *Grandfathers Chair*, sketches from New England history for children was published in 1841, and for about two years he was a member of the Brook Farm Community. Having married Miss Peabody of Salem, he settled in Concord where he wrote two series of *Twice Told Tales* and *Mosses From an Old Manse*, 1843. Literary work was still so unprofitable that he obtained the position of Surveyor of Customs at Salem, 1846-1849. His masterpiece *The Scarlet Letter* appeared in 1850 and was hailed at home and abroad as a work of genius. From 1852 to 1856 he was American consul at Liverpool, Eng., and wrote *The English Note Book* and *Our Old Home. French and Italian Note Books* appeared in 1857-1858. Among his other works not previously mentioned are *The Wonder Book*, 1851; *The Blithedale Romance*, 1852; *Tanglewood Tales*, 1853; *The Marble Faun*, 1860; *Dr. Grimshaw's Secret* unfinished, was published in 1882 and *Septimust Fulton* also unfinished in 1871.

HAWTREY, CHARLES HENRY (1858), Eng. actor-manager and playwright; his adaptation of *The Private Secretary* 1884 achieved remarkable success, as also did *A Message from Mars*, 1899.

HAXO, FRANÇOIS NICOLAS BENOIT BARON (1774-1838), Fr. general and most famous of Napoleon's engineers.

HAY. By the word hay we mean the dried stems and leaves of herbaceous plants, the grasses (Gramineae), clover and allied plants (Leguminosae), which are used as fodder for domestic animals, during periods when green food is not available. The methods of preparing hay vary considerably in details in different localities, but in principle they are the same. The herbage is first mown and then spread out, turned, and shaken in the fields to dry under the action of wind and sun. The more quickly this drying process is finished the finer is the aroma of the hay, and the more palatable is it to animals. It is next gathered into windrows and finally stored in hayricks. The time of drying varies from two to ten days, but under unfavorable weather conditions the hay is frequently damaged or spoiled. Insufficient drying may cause subsequent mouldiness (due to fungoid growth) or heating (due to bacterial action) in the rick, but this is sometimes held to improve the product. In England it is usual to cut permanent meadows for hay; while in Scotland a special hay crop is more generally grown. The chief hay

plants are clover and the grasses—the most important being rye-grass, timothy, foxtail, cocksfoot, sweet vernal, the oat grasses, and several species of fescue. See GRASS.

HAY, JAMES, JR. (1881), writer, *b.* at Harrisonburg, Va. 1899-1903 studied at University of Virginia; 1903-1904 reporter for Washington Post; political reporter for the Washington Times, 1904-1909. Since 1909 has been writing special articles and fiction for magazines. Author of *The Man Who Forgot*, 1915; *Mrs. Marden's Ordeal*, 1918; *The Winning Clue*, 1919; *The Melwood Mystery*, 1920; *No Clue*, 1920; *The Unlighted House*, 1921.

HAY, JOHN (MILTON) (1838-1905), American statesman; *b.* in Salem, Ind., Oct. 8, 1838; *d.* near Newbury, New Hamp. July 1, 1905. Graduating from Brown University in 1858, he studied law with his uncle Milton Hays and was admitted to the bar in 1861. Having worked for Lincoln in his first election, Hay was made one of the presidents secretaries. After Lincoln's death he was appointed secretary of legation in Paris, and in 1867 charge d'Affaires in Vienna, resigning the next year. First secretary of legation, Madrid, 1868-1870 he returned to this country to become an editorial writer on the N. Y. Tribune. After marrying the *d.* of Amasa Stone of Cleveland, Ohio, he moved to that city and was engaged in literary work until 1879, when appointed by President Hayes, Assistant Secretary of State, Evarts. In 1881 he took charge of the N.Y. Tribune, and began with Nicolay the great work on Lincoln, 1881-1887. In 1897 he was appointed minister to Great Britain, and Secretary of State from 1898 until his death. He obtained justice for China after the Boxer revolt, securing her integrity and an 'Open door' policy from European nations. He negotiated the Hay-Pauncefote Treaty and supported the Hague Conference, inducing the Powers that claimed an indemnity from Venezuela to submit the question to The Hague tribunal. He signed the treaty with Colombia that granted right of way for the Panama Canal, and persuaded Great Britain to submit the Alaska boundary question to arbitration. Roosevelt on his succession urged Hay to remain as Secretary of State and he retained the office when Roosevelt was re-elected. Publications *Pike County Ballads, Castilian Days, The Bread Winners*, a novel, 1885; *Complete Poetical Works*, 1916; *The Addresses of John Hay* were published after his death. He edited *Complete Works of Abraham Lincoln*, 1894.

HAYASHI, BARON GONSUKE (1861), Jap. diplomatist; secretary of legation, 1896; was subsequently ambassador in Rome and in Peking. Prior to becoming ambassador in London, 1920 was governor of Kwantung Leased Territory.

HAYDEN, FERDINAND VENDEVER (1829-1887), an American geologist, *b.* in Westfield, Mass. He graduated from Oberlin College in 1850 and served in the Civil War, rising to the rank of lieutenant colonel. He spent many of the years following in exploring the Rocky Mountain region and edited a number of geographical and geological reports for the United States government. He also wrote several books on the exploration of the West.

HAYDN, FRANZ JOSEPH (1732-1809), Austrian composer; *b.* Rohrau, near Vienna; a wheelwright's *s.*; joined St. Stephen's Cathedral choir, Vienna, 1740; app. conductor of Count Morzin's band, 1759; patronised by Esterhazy family; exceedingly popular in Vienna, then greatest European music centre. Among his pupils was Beethoven. H. greatly influenced his young friend, Mozart. H. was a slow but prolific composer; the first great writer of quartet and the 'Father of Symphony', paving the way for Beethoven. Compositions: 118 symphonies, including *Farewell*, 1772; *Toy*, and 12 written for Eng. visits, 1791-1794; 83 quartets, trios, operas, and oratorios—greatest, *The Creation*, 1799 and *The Seasons*, 1800.

HAYDON, BENJAMIN ROBERT (1786-1846), Eng. his. painter; *b.* at Plymouth; studied at Royal Academy. Quarrels with the Academy and debt troubles made his life a burden, and he committed suicide. His best pictures are *The Judgment of Solomon*, (1814), *Christ's Entry into Jerusalem*, and *The Resurrection of Lazarus*.

HAYES, PATRICK JOSEPH (1867), an American Roman Catholic prelate, *b.* in New York City. He graduated from Manhattan College, in New York, in 1888, and was ordained a priest in 1892. During 1903-14 he was president of Cathedral College, at the end of which period he was consecrated auxilliary bishop of New York. In 1919 he was appointed Archbishop of New York.

HAYES, RUTHERFORD BIRCHARD (1822-1893), Nineteenth president of the United States, *b.* in Delaware, Ohio, Oct. 4, 1822; *d.* in Fremont, Ohio, Jan. 17, 1893. Graduating from Kenyon College, Gambier, Ohio, in 1842, and the Harvard Law School, 1845, he was admitted to the bar and

after some country practice established an office in Cincinnati. When the Civil War broke out he joined the Federals as a major of volunteers. Promoted brigadier-general he was brevetted major-general for distinguished services in the West Virginia campaign of 1864, especially in the battles of Fishers' Hill and Cedar Creek, Va. The Republican Party elected him to Congress 1868-1872-1875. In 1876 he was nominated for President by the Republicans while the Democrats chose Samuel J. Tilden. The contest over the election that followed was unique in American political history. The election returns in South Carolina, Louisiana, and Florida gave rise to charges of fraud from both sides. A commission was appointed to investigate the returns and decided that Hayes had received 185 Electoral votes to 184 for Tilden. President Hayes during his administration worked for Civil Service reform against his party's opposition. He brought the South relief by removing troops without whose backing the 'carpet-bag' governments could not have held power. Specie payments suspended since the Civil War, were resumed. After leaving office Mr. Hayes did notable service in the interests of education and prison reform in the South.

HAY-FEVER, HAY ASTHMA, OR SUMMER CATARRH, disease, often hereditary, occurring in the summer, which has been shown to be due to extreme sensibility to the pollen of gasses, at that time floating in the atmosphere; characterised by headache, swelling with watery discharge of the nasal mucous membrane, paroxysms of sneezing, and cough. Treatment is change of air, with avoidance of vegetation; cocaine or suprarenal extract applied to the mucous membrane, or destruction of the sensitive part of it by the cautery; and tonics, *e.g.* arsenic or quinine preparations, for the general system. A serum has been prepared, which is a very effective cure.

HAYLEY, WILLIAM (1745-1820), Eng. poet and biographer; his poetical works include *Triumphs of Temper, Essays and Epistles,* which were very popular; declined laureateship; also wrote *Lives* of Cowper 1803-4, Milton, and Romney.

HAYMARKET SQUARE RIOT, a riot in Haymarket Square, Chicago, 1886, in which seven policemen were killed and sixty wounded by a bomb when dispersing an anarchist meeting. A number of anarchists were hanged.

HAYNAU, JULIUS JACOB (1786-1853), Austrian field-marshal; execrated in Liberal countries for his severity towards revolutionaries.

HAYNE, ROBERT YOUNG (1791-1839), Amer. politician; senator, 1823; advocated free trade; Gov. of S. Carolina, 1832; opposed Jackson.

HAYNES, ELWOOD (1857), Inventor; *b.* at Portland, Ind. Bachelor of Science of Worcester Polytechnic Institute in 1881. At Johns Hopkins from 1884-1885. Teacher of sciences from 1885-1886 at Eastern Indiana Normal School. 1886-1880 was manager of Portland Natural Gas and Oil Company. President since 1898 of Haynes Automobile Company. In 1881 discovered tungsten chrome steel, 1897 alloy of chomium and nickel, 1900, alloy of cobalt and chromium. On exhibition at the Smithsonian Institution is the oldest automobile in existence and which he constructed and designed in 1893-1894. First person to use aluminum in automobile engine, 1895. In 1903 invented and built rotary valve gas engine. In 1911 discovered 'stainless Steel' which was patented in 1919. Trustee of Western College. Member of Society of Automobile Engineers, Iron and Steel Institute, London, American Chemical Society.

HAY-PAUNCEFOTE TREATY, a treaty negotiated by John Hay (*q.v.*) on the part of the U.S.A., and Lord Pauncefote on behalf of Great Britain, abrogating the Clayton-Bulwer Treaty (*q.v.*), and providing for the construction of a Panama Canal (*q.v.*) under U.S. control and for its neutralisation on the same basis as Suez Canal. When submitted to the senate in 1900 it was ratified, but with such amendments, especially regarding its neutralisation, that Great Britain refused to ratify them. A further treaty was negotiated in 1901 and passed by the senate. It demanded no guarantee of neutrality. although the general principle of neutrality of the Clayton-Bulwer Treaty was retained, and in time of war the U.S. were given certain rights of control not definitely specified.

HAYS, WILL H. (1879), American, lawyer and cabinet officer; *b.* Sullivan, Ind. He graduated from Wabash College in 1900 and was admitted to the Indiana bar in the same year. He was city attorney for Sullivan 1910-13 and took an active part in political management both in local and State affairs. His adroitness as a manager or political campaigns soon gained him a national reputation, and in 1918 he was elected Chairman of the Republican National Committee. He managed the Presidential campaign of Mr. Harding, and on the election of the latter was offered the position of Postmaster General in the

cabinet. He held this office for a year and then resigned to become the head of the organization of motion picture producers of the United States, 1922.

HAYTI. See HAITI.

HAYTON (fl. 1250), king of Cilicia, 1224-69; allied himself with Mongols; travelled in W. Africa, Mongolia, and elsewhere, an account of his travels being written by Kirakos Gandsaketsi; abdicated, 1269, and entered monastery.

HAYWARD, ABRAHAM (1801-84), Eng. author; by profession a barrister, but became an extensive contributor to the *Quarterly Review* and other critical journals; pub. *Biographical and Critical Essays, Eminent Statesmen and Writers*, etc.; possessed a prodigious memory and exercised much influence on public opinion.

HAYWARD, SIR JOHN (c. 1560-1627), Eng. historian; pub. *The First Part of the Life and Raigne of King Henrie IV.*, 1599; *Lives of the Three Norman Kings of England*, 1613; *The Life and Raigne of King Edward VI.*, 1630.

HAYWARD, WILLIAM (1877), lawyer; *b.* in Nebraska; graduate of Nebraska City High School. Bachelor of Laws of University of Nebraska, 1897. In 1897 he began practise at Nebraska City; Captain in Spanish American War and later Colonel; 1901-1902 county judge of Otoe County, Nebraska; chairman 1907-1909 of Republican State Central Committee; from 1910-1911 traveled around world. Member of law firm of Wing and Russell, 1911-1912; from 1913-1914 assistant district attorney of New York; manager of Charles S. Whitman's campaign for governor; counsel to New York legislative committee to investigate public service commissions; public service commissioner 1st District, New York, 1915-1920; resigned 1918. Recruited, organized and trained the 15th Infantry, N.G.N.Y. One of first regiments to go to France in 1917. Under fire 191 days, longest of any American regiment. Decorated by France and United States. United States attorney, Southern District of New York, 1923.

HAYWOOD, ELIZA (c. 1693-1756), Eng. novelist; wrote *Secret History of the Court of Caramania*, 1727 and other novels.

HAZARA (34° N., 73° 5′ E.), district, Peshawar, India; surface is valley between mountain ranges; drained by affluents of Indus. Pop. 560,000.

HAZARD, game of dice, fashionable in the XVIII. cent.

HAZARD, CAROLINE (1856), ex-College President. *B.* in Rhode Island. Educated privately and studied abroad. Honorary Master of Arts, 1899, University of Michigan; Doctor of Literature, 1899; Brown College, Doctor of Laws, 1905; Tufts College. From 1899-1910, president of Wellesley College; member of American Academy of Political and Social Science, American History Association. Author : *Life of J. L. Diman*, 1886; *Thomas Hazard, Son of Robert*, 1893; *Narragansett Friends Meeting*, 1894; *The College Year*, 1910; *The Yosemite and other Verse*, 1917. Was chairman of First Liberty Loan, 1916; War Savings Campaign, 1917; United War Work Campaign, 1918.

HAZARIBAGH (23° 59′ N., 85° 20′ E.), town, Bihar and Orissa, India. Pop. 15,799. District has area of 7020 sq. miles. Pop. 1,200,000.

HAZEBROUCK (50° 44′ N., 2° 31′ E.), town, Nord, France. Pop. 13,000.

HAZEL, a shrub (*Corylus avellana*), natural order *Cupuliferoe*. It is *monoecious*, but the *stamens* and *carpels* do not occur in the same flowers. The *staminate* flowers hang in *pendulous inflorescences* named *catkins*. The small bud-like *carpellary inflorescences* are distinguished by the protruding tufts of red *stigmas*. These are borne on special *dwarf* shoots. The fruit is a one-seeded edible nut (cob or filbert), around which the *bracts* form a green cup.

HAZELTON, a city of Pennsylvania, in Luzerne co. It is on the Pennsylvania, the Lehigh Valley, and the Wilkesbarre and Hazelton railroads. Surrounding it is an extensive anthracite coal mining region, of which it is the center. In addition the city's industries include railroad shops, iron works, and plants for the making of flax, brooms, macaroni, chewing gum, etc., it has a Miners' State Hospital and is the seat of Hazelton Seminary. Pop. 1920, 32,267.

HAZLITT, WILLIAM (1778-1830), Eng. essayist and critic; *b.* Maidstone; *s.* of Unitarian minister; studied theol., and later, art, but subsequently took up journalistic work; formed friendships with Leigh Hunt and the Lake poets. He published *The Round Table*, 1817, a vol. of literary sketches; *Characters of Shakespeare's Plays*, 1817; *View of the English Stage*, 1818; *Lectures on the English Poets*, 1818; *English Comic Writers*, 1819 *Dramatic Literature of the Age of Elizabeth*, 1821; *Table Talk*, 1821-22; *The Spirit of the Age*, 1825;

Life of Napoleon Buonaparte, 1828-30, etc.

HEAD. The human body is obviously separable into head, trunk, and limbs, of which the first is naturally divided into skull and face. Vertebrates possessing a head are termed *Craniata*, the higher types of which have the hard bony case of the skull containing the brain, which is continuous with the spinal cord, while the cavity of the face is almost entirely occupied by the mouth and pharynx, into the latter of which the upper end of the alimentary canal opens. It will be seen that the fundamental structure of the human body is that of a double tube, the dorsal and ventral, and in a comparison of the head with the trunk it will be found that in the former the dorsal tube is large relatively to the ventral. This condition is reversed in the trunk. The head is also remarkable on account of the large number of organs of special senses which it contains, such as those of smell (nose), taste (tongue), sound (ear), sight (eye), (See under these headings), hence there is no necessity to enlarge here on the vital character of this part of the human body.

Development.—In the embryo the distinction between the head and trunk by the formation of a cervical constriction is a change of comparatively late occurrence, though long before this constriction appears, the characteristic features of the parts have become apparent. At first the head may be said to consist wholly of the cranial part; the face being developed later from a series of outgrowths or bars of the cranium.

HEADACHE, is present at the commencement of all fevers and many other diseases. When persistent, it may be due to tumour, or other changes in the brain. The term H. is often used to include neuralgia, or pain due to the nerves or nervous structure, as the eye, when it may be relieved by appropriate glasses to correct the otherwise fairly normal vision. The H. may also be caused by the fact that the glasses used are inappropriate, when measures should be taken to have them changed as soon as possible. H. may also be due to the general circulation, as in diseases of the kidney and heart. Ordinary Hs. often appear in the form of megrim or hemicrania, so called because only one part of the head is affected, or the pain is greater in one half than in the other. Broadly speaking, they are due to the alimentary canal, as is shown by the fact that they are frequently accompanied and relieved by vomiting. As the cause originates in connection with the food tract, the pain is prevented by modifying the diet or aiding its removal by laxatives or purgatives, or so treating the accompanying anaemia that the digestion is better able to put to a good use the food supplied to it. Apart from inducing vomiting, by tickling the back of the throat with the finger or a feather, plain hot water, or with salt or mustard aids inunloading the stomach. In fact, the treatment of H. is that of gastric catarrh, dyspepsia, or whatever name is given to alimentary disturbance; Hs., therefore, may be prevented by a plain diet at regular intervals. As the digestion is apt to be upset by worry, quarrels, vitiated air, railway journeys, and sea voyages, precautions should be taken when these risks are likely to be incurred. Particular search should be made for the dietic or other cause of H.

HEAD-HUNTING, OR HEAD-SNAPPING, a custom once prevalent among all Malay races, but now rapidly dying out, of obtaining and treasuring the heads of their enemies. Even to-day it survives among the Dyaks of Borneo and other Eastern tribes. It is believed to have had its origin in religious motives, the worship of skulls among the Malays being universal, and is said to have existed in the Philippine Islands in 1577. The chief examples of head-hunters are the Was, a hill-tribe on the north-eastern frontier of India, and the Nagas and Kuhus of Assam. Severe repressive measures, however, have led to the decrease of the custom.

HEADLEY, JOEL TYLER (1814-1897), an American historian, *b.* in New York. He graduated from Union College in 1839. He took an active part in politics and in 1855 was elected Secretary of State for New York. He wrote many popular books on historical subjects. These include, *Napoleon and his Marshals*; *Oliver Cromwell*; *Life of Washington* and *The Great Rebellion*.

HEALING, MENTAL. See AUTO-SUGGESTION.

HEALTH, the condition of the body in which the various functions are performed normally. A district is said to be healthy when the prevailing conditions are accompanied by a scarcity of diseased individuals. In order that H. may be maintained in an individual or in a community, attention must be directed to the following among other considerations: (1) The duty of individuals in keeping their bodies clean and free from disease by attention to food, clothing, habits, and hereditary or occupational tendencies; (2) the duty of the community in relation to the drainage of houses and towns, the building of healthy houses, removal of waste matter, legisla-

tion against hurtful employments, and the prevention and stamping out of disease. The science of hygiene has done a great deal in both of these directions. By means of exhibitions, lectures, handbooks, and instruction in schools, the individual has been taught to look after and preserve his H. by attention to simple sanitary rules. To keep the body in H. the proper preparation of good food is essential, and girls and women are being encouraged and instructed in this art by means of lectures and classes in the city, and often by house visitation by the district visitor of H. in the country. The body must be kept clean by baths, and steps are being taken by town councils to ensure that the individual may be enabled to take a bath in comfort and at no great expense. Special organisations and physicians of specialised experience probably have more to do with such cures than the actual chemical constitution of the waters.

HEALTH ASSOCIATION, THE AMERICAN PUBLIC. A conference was held in New York, April 18, 1872, when the representatives of five states and five cities appointed a committee to organize a national association for the advancement of sanitary science. In September the committee made a report, a constitution was adopted and officers were elected. The purposes of the association are served by annual meetings when papers are read and addresses made, which are published in The American Journal of Public Health. The association exerts a wide influence in spreading the knowledge of sanitary science. Membership, 1922, 4,000.

HEALTH INSURANCE, a form of insurance whose main object is to protect the wage earner or salaried man from unemployment during sickness. It had its beginnings in the British 'friendly societies', organized over a century ago, these being voluntary, co-operative groups of men and women who paid a few pennies a week as dues and during sickness enjoyed a financial benefit from the treasury of the organization, enough to cover the minimum of living expenses. In the United States these societies took on special development in the form of the numerous secret fraternal orders, such as the Independent Order of Odd Fellows, the Elks, etc., the glamor of pagantry being added to the pecuniary benefits. Another form of life insurance companies is the great 'mutuals', also co-operative in form, though practically the membership has little control. Here, in theory at least, the policy holders are supposed to receive in benefits the sum total of the company's receipts, except what is laid aside in a reserve fund. A third form is the purely commercial enterprise, carried on as a profit-making business by a corporation. The form of health insurance which promises in the future to become predominant is compulsory state insurance, such as was instituted in Germany, in 1884. In 1916 the American Association for Labor Legislation attempted to have bills for compulsory insurance in the industries passed in the legislatures of Massachusetts, New York and New Jersey. While these attempts failed, enough interest was aroused in Massachussets to have a special commission appointed to study the subject. This idea is supported by the U. S. Commission on Industrial Relations, the U. S. Federal Health Service and the U. S. Department of Labor.

HEALY, GEORGE PETER ALEXANDER (1808-94), Amer. artist; excelled in portraits; painted several Amer. Presidents and other public men.

HEALY, TIMOTHY MICHAEL (1855), Irish politician and lawyer; called to Irish bar, 1884; Q.C., 1899; bencher, Gray's Inn, 1910; M.P., 1880-1917; together with William O'Brien founded the Independent Nationalist party; alert, dexterous, resourceful, Eloquent, and ironically witty debater; was one of bitterest opponents of Parnell's continued leadership; secured insertion of 'Healy clause' (that in future no rent should be chargeable on tenants' improvements) in Land Bill of 1881; author of *A Word for Ireland*, 1886, etc.

In 1922 he was appointed Governor-General of the Irish Free State. See IRELAND.

HEANOR (53° 1′ N., 1° 22′ W.), town, Derbyshire, England; coal, iron, hosiery. Pop. 19,851.

HEARING. See EAR.

HEARN, LAFCADIO (1850-1905), a writer on Japan; *b.* Ionian Islands, of Irish and Gr. parentage; some years a journalist in America; became subsequently naturalized in Japan, where he married Jap. wife and turned Buddhist; author of *Glimpses of Unfamiliar Japan*, 1894; *Shadowings*, 1900, etc., which vividly protray Jap. character and social conditions.

HEARNE, SAMUEL (1745-92), Eng. Arctic discoverer; found copper by Coppermine River, whose mouth he discovered.

HEARNE, THOMAS (1678-1735), Eng. antiquary; edit. Camden's *Annals*, Fordun's *Scotichronicon*, Leland's *Itinerary* and *Collectanea*, and numerous other antiquarian works.

HEARSE (Fr. *herse*, from Lat. *hirpex*, harrow), vehicle used to convey body to grave; usually black framework wit glass sides. The framework resembles that of barrow-like candle-stands used in Rom. Catholic funeral ceremonies; formerly a funeral monument.

HEARST, PHEBE (APPERS ON), (1842-1919), an American philanthropist. In 1861 she married George F. Hearst, United States Senator from California. At his death he left her an immense fortune from which she donated about four million dollars to the University of California for new buildings. She also gave $200,000 to the American University of Washington and made many other large gifts to educational and other institutions. She was the *m.* of William R. Hearst.

HEARST, WILLIAM RANDOLPH (1863), American newspaper publisher; *b.* San Francisco. He studied at Harvard 1882-85, and then assumed publication of the San Francisco Examiner, formerly the property of his father. He bought the New York Journal in 1895, changing the name of the morning edition later to the American. He founded the Chicago American in 1900, and since that time has become owner of a large number of newspapers and magazines, including the Boston American, Los Angeles Examiner, Chicago Examiner, Atlanta Georgian, New York Deutsches Journal, Cosmopolitan Magazine, Hearst Magazine, Good Housekeeping, Harper's Bazaar, Motor Magazine, Motor Boating Magazine and others. He served in the 58th and 59th Congresses as representative from a New York district. He was a candidate for the office of Mayor for New York in 1905 and 1909, being both times defeated. He was Democratic nominee for Governor of New York State in 1906 but was defeated by his Republican opponent, Charles E. Hughes. He controls the syndicate known as the International News Service. The policies of his papers have been radical, and he has been unsparing in his attacks on men and institutions that aroused his antagonism.

HEART, a cone-shaped, hollow, four-chambered, muscular organ, about the size of the closed fist, which acts as the central pump of the circulatory system, and is situated in the central part of the chest, resting upon the diaphragm, between the two lungs. It is held in place by the great vessels which leave or enter the organ, and by a serous membrane, the *pericardium*, in the form of a double bag, which ensheaths it completely, holding the h. in position by its attachment to the upper surface of the diaphragm. The two upper and posterior chambers of the h., or the *auricles*, are the receiving chambers for the blood; the right auricle receives the impure or venous blood conveyed to the h. by the superior and inferior *venoe cavoe*, carrying the blood from the upper and lower parts of the body, and the *coronary vein*, carrying the venous blood from the substance of the h. itself; the left auricle receives the purified blood from the lungs, conveyed to it by the pulmonary veins.

From the auricles the blood passes to the two lower and anterior chambers, or *ventricles*, which are larger than the auricles and have strong muscular walls; the right ventricle propels the impure blood to the lungs, where it is purified, while the left ventricle, which is the strongest and most muscular chamber, propels the purified blood throughout the body. The right auricle communicates with the right ventricle by an opening which is guarded by a valve, the *tricuspid*, opening towards the ventricle and composed of three triangular flaps which are attached by fibrous cords to muscular projections on the walls of the right ventricle. The opening by which the left auricle communicates with the left ventricle is guarded in the same way by a valve, the *mitral*, composed of two flaps. At the point where the pulmonary artery leaves the right ventricle, and similarly where the aorta leaves the left ventricle, there is a valve to prevent the flow of blood back to the respective chambers, composed in each case of three pocket-like cusps.

The action of the h. consists, first, of the simultaneous contraction of the auricles, which drives the blood into the flaccid ventricles, the quantity and weight of the blood in the large veins preventing any flow backwards into them; this is followed by the contraction of the ventricles, which drives the blood into the main arteries, the reflux of blood into the auricles being prevented by the closure of the tricuspid and mitral valves; after the contraction of the ventricles there is a pause, when the h. is at rest, then the contraction of the auricles recommences, and so on.

HEARTH.—(1) Part of floor where fire is placed; (2) lowest part of blast-furnace above the crucible; (3) bottom of reverberatory or open-h. furnace; (4) brazier. H. Money (2s.) was levied 1662-89 on every house liable to poor-rates. H. Penny was payment to Rome dating from Saxon times.

HEARTS, card game for two or more players; each player tries to get rid of all hearts in his hand.

HEAT is that particular form of ener-

gy which consists in the kinetic and potential energy of the molecules of matter (see ENERGY). The ultimate particles of any mass are, at all temperatures above the lowest, in the state of agitation; each atom may be moving as a whole, and it may have internal motions; the molecules (consisting of an assemblage of two or more atoms chemically alike or different) may have similar motions, and with them there may be associated potential energy due to the separation of their constituent atoms. All energy dependent on such motion or position is classed as heat, using the term in its strictest sense. The popular acceptation of the term is different, and is associated with the relative hotness or coldness of a body as perceived by the senses—*i.e.*, it is related to the *temperature* of the body, not to the heat-energy contained in the body.

The term *latent heat* is applied to heat which when supplied to a body produces no change in temp. so as to be appreciated by a thermometer—*e.g.*, when a solid becomes liquid, the heat required for the change is called the latent heat of fusion of the solid; from liquid to vapour we have the latent heat of vaporization. Correctly speaking, the heat has been transformed into potential energy due to the separation of the molecules of the ice during the passage of the substance into the liquid form. *Radiant heat* is not heat in the sense used above, but is energy of wave motion in the ether, and only differs from light in the length of its waves.

In ordinary circumstances—*i.e.*, when no change of physical state takes place—any change in the heat-energy contained in a body produces a change in the state of hotness or coldness of the body, and to this state the name *temperature* is given. In order to give numerical expression to temp. a scale is chosen. The common attribute of all temp. scales is that they have two definite points, fixed by reference to two definite conditions of a standard substance as regards its hotness or coldness, and this interval of temp. is divided into a certain number of degrees. Any instrument which will indicate by means of such a scale the temp. of a body is termed a *thermometer*.

Being one form of the objective reality which we term energy, heat must be capable of measurement. The unit of heat generally employed in scientific work is the *calorie*, which is the amount of heat required to raise the temp. of 1 gram of water from 15° to 16° C. For engineering purposes the *Brit. thermal unit* is employed. It is the amount of heat required to raise the temp. of 1 lb. of water by 1° F., and is equal to 252 calories. Another unit in practical use is the amount of heat required to evaporate 1 lb. of water at the boiling-point under standard atmospheric pressure, and is equal to 243,583 calories. The determination of a given quantity of heat in terms of these units is dealt with below. Heat must also have quantitative relations with other forms of energy, and it is found that 1 calorie is equivalent to 42 million *ergs*, and that the British thermal unit is equivalent to 776 foot-pounds.

Heat may be transferred from one body to another or from one part to another of the same body in three ways—viz., conduction, convection, radiation. In most cases all three modes of heat transference operate together. In *conduction*, heat is passed from one particle to an adjoining particle at a lower temperature (or on a larger scale from one body to another in contact with it) until the temperatures are uniform. In some substances (good conductors—*e.g.* silver, copper, and metals generally) the transference takes place rapidly. In others (bad conductors—*e.g.*, woollen cloth, wood, etc.), it takes place slowly.

Heat has also very important effects when supplied to or withdrawn from a body. Indeed, there are few physical properties of matter which, otherwise constant, are not thus affected. The first effect is, in general, a change in temp. The relation between the amount of heat added to a body and the consequent rise in temp. is expressed by the *specific* heat of the substance, and this is defined as the number of units of heat required to raise the temp. of unit mass of the substance by 1° C. The method of determining specific heats is detailed below.

The next important effect of adding heat to a body is to change the volume, and in general all bodies increase in volume when heated. The increase is expressed numerically by the *co-efficient of linear expansion*, which is the increase in length of unit length of a substance when heated by 1° C. The co-efficient of cubicle (or volume) expansion is correspondingly defined, and it is approximately thrice the linear coefficient. In gases, the coefficient of volume expansion is approximately ·00366. The expansion of bodies when heated and their contraction on cooling finds many useful applications in industry and in the arts. Obviously, there is need for a substance that will not be so affected, and this has been found in an alloy of steel and nickel, containing 36 per cent. of nickel, known as *Invar*, which has the remarkably low coefficient of expansion of ·00000087, about thirteen times smaller than the co-efficient of either of its constituents. It

is now used for pendulum rods in clocks, and in various measuring instruments.

The third important effect of heat on matter is change of physical state. In general, the continuous addition of heat to a body causes it to pass from the solid to the liquid, and then to the gaseous (or vaporous) state. It is probable that if the means were available, all bodies could be made to assume any of these three states, provided that such assumption involves no chemical change. Changes of temp. also cause changes in the viscosity of fluids, electric resistance magnetic properties of matter, etc. Lastly, there must be noted the important fact that 'the velocity with which a chemical system strives to reach its state of equilibrium increases enormously with the temp.' (Nernst). Usually, the rate at which a chemical reaction takes place is doubled or trebled by a rise in temp. amounting to 10° C.

Calorimetry is concerned with the measurement of quantities of heat. The apparatus used is termed a *calorimeter*. In the metric system the unit quantity of heat is the *calorie*, and *great calorie* = 1,000 calories. Substances other than water, except liquid hydrogen, do not require so much heat for 1° rise—*e.g.*, ice, mercury, copper, air, steam. Mercury absorbs about .003, copper about .091 calories. These numbers are the specific heats (S.H.), and increase with increase of temp. of measurement. Carbon, boron, and silicon show this increase remarkably, so that at high temperatures they tend to conform to *Dulong and Petit's law*, specific heat—atomic weight = 6·4 nearly. A simple calorimeter may be made from a small sheet-copper vessel supported on corks and isolated from air-currents by being placed inside a larger vessel. Such a vessel has a definite *water-equivalent*, which may be found by placing a given mass of heated water (A) at temp. *t* inside it and stirring it, when a rapid fall takes place due to heat taken by the calorimeter and the stirrer. If *tc* is the original temp. of the calorimeter and *tf* the final temp. of the water and calorimeter, the water equivalent (W.E.) is WE = A (*t*—*tf* *tf*—*tc*).

Once this is found, the specific heat of a body may be found where it is practicable to place such a body at a given temp. in a given mass of liquid in the calorimeter. If M be the mass of the substance heated to temp. *ts* *m* the mass of the water (any liquid of known specific heat would do), *to* the original temp. of the water, *we* the water equivalent of the calorimeter, and *tf* the final temp. of the mixture, then the specific heat (S.H.) of the substance is given by SH.M (*ts*—*tf*) = (*m*+*we*) (*tf*—*to*), or if some other liquid of specific heat *sh* be used, SH.M (*ts*—*tf*) = (*sh.m*+*we*) (*tf*—*to*).

For any body the specific heat — mass gives the water equivalent or *thermal capacity*. A substance with a low specific heat like mercury comes rapidly to the temp. of its environment and is suited for thermometers. Water, again, stores much heat, is heated and cooled slowly, and is adapted for heating purposes. This property of water also causes certain meteorological effects. For gases and vapours there exist a specific heat when the volume is kept constant, and a specific heat when the pressure is constant. The latter is greater than the former, owing to the work done in expansion against the pressure. The specific heats of steam in steam-engine theory and of air in gas- and oil-engine theory are of high importance.

Again, the latent heat of fusion of a solid, *e.g.* ice, is determined by finding the number of calories of heat required to convert 1 gram of ice at 0° C. into water at the same temp. Similarly the latent heat of steam (more correctly of vaporization of water) is determined.

HEAT, ANIMAL. See ANIMAL HEAT.

HEAT, CONDUCTION OF. See CONDUCTION OF HEAT.

HEAT ENGINE. See THERMO-DYNAMICS.

HEAT MEASUREMENTS. See CALORIES.

HEAT REGULATORS. Devices, usually automatic or semi-automatic, for the control and regulation of the amount of heat generated by any of the usual means, such as coal or coke fire, oil or gas flame, electric resistance or arc, etc. The correct name for this class of apparatus is temperature regulators, since they control primarily the temperature of a certain place and only secondarily the heat manifested. Such contrivances are widely used to control the temperature of rooms, bake ovens, metallurgical furnaces, drying rooms and kilns, refrigerators, and for similar purposes. For more complete description, see AUTOMATIC HEAT REGULATORS.

HEATH, HEATHER, LING, comprises a group of woody, low-growing shrubs, natural order *Ericaceae*. *Erica tetralix* (cross-leaved heath) and *E. cinerea* (bell-heather) are insect-pollinated and *gamopetalous*. *Calluna vulgaris*, *Erica vulgaris*, *Ling* or *Heather*, has sepals resembling petals, very small petals, and is wind-pollinated. All are moor-plants, mostly evergreen, with narrow rolled leaves to prevent excessive evaporation.

HEATH, BENJAMIN (1704-66), Eng. writer on classical and religious subjects; *f.* of Benjamin H. 1771-85; headmaster of Harrow, who formed the noted *Bibliotheca Heathiana.*

HEATH, WILLIAM (1737-1814), Amer. general; failed in attack on Fort Independence, 1777; member of Board of War, 1779; Senator, 1791.

HEATHEN, Teutonic word of doubtful derivation, applied after acceptance of Christianity to those who clung to the Teutonic deities.

HEATHER. See HEATH.

HEATHFIELD, GEORGE AUGUSTUS ELLIOTT, BARON (1717-90), Brit. general who as gov. of Gibraltar defended it against French and Spaniards, 1779-82.

HEATING AND VENTILATION. These two subjects, while apparently distinct, are really so closely connected that it is customary to consider them together. They cover the proper conditioning of the air for health and comfort, as regards both temperature and purity. Deficient heating of dwellings or public buildings, or even conveyances, is comparatively rare in this country, but owing to the fact that the discomfort produced by foul air is not felt acutely in its early stages, improper ventilation is much more common. The various devices used for heating enclosed spaces have come to be considered such fundamental necessities, that it is difficult to realise how recent is their origin. The open fire was the only device known over the greater part of the world until less than two hundred years ago, and even chimneys were not used until the twelfth century. The first stove, invented by Benjamin Franklin, was constructed in 1744, and although steam was used for heating in England as far back as 1750, it was a hundred years later before it was applied for the same purpose in the United States. The Romans are believed to have made some use of a hot water heating system, and in 1816 a plant on modern principles was constructed in England, but it was not until 1870 that the system was introduced into the United States. Even the hot air furnace, which is often looked upon as of ancient origin, dates only from 1835, when the first furnace was constructed at Worcester, Massachusetts.

The temperature to which dwellings and other buildings are heated varies considerably in different countries. In the United States and Canada, 68-70° F. is considered necessary for comfort, but in England a temperature of 62° F. is preferred. Apparently, the lower outside temperature creates a demand for higher temperatures within. The heating of a building is brought about either by radiation, by connection or by a combination of the two. An open fire radiates heat and so heats the walls, the furniture and the body. The steam or hot water radiator heats the air by convection, and also warms surrounding objects by radiation. The hot air furnace relies entirely upon convection, the house being warmed by currents of hot air.

Modern Methods of Heating. The open fireplace still remains, the principal method of heating dwellings in Europe. In the United States and Canada, however, it is considered utterly inadequate, and has come to be looked upon merely as a pleasant and desirable adjunct to the central heating equipment. The *stove* is still widely used in country districts. It is much more efficient than the open fireplace, but is dusty, clumsy and is apt to produce foul air. The *hot air furnace* is very common in small houses. It is cheap to install, and owing to the fact that it continually draws fresh air into the house, it is healthy. In the older type of furnace, hot air from a central chamber travels to different parts of the house through large pipes; in the more modern *pipeless furnace,* the air of the entire house is warmed through a central register located on the ground floor. With the ordinary hot air furnace, trouble is frequently experienced in obtaining uniform heating. During a high wind the sheltered side of the house becomes overheated, while the side to windward receives no heat at all. In the pipeless type, this trouble is not experienced, heating being uniform throughout the house. The *steam furnace* consists of a boiler, located in the cellar, which generates steam under pressure and distributes it to radiators in different parts of the house. In large buildings the radiators are sometimes placed in the basement and air is warmed by being drawn over them and then conveyed to the rooms to be heated. The *vapor vacuum system* is a modification of steam heating. Instead of being under pressure, the steam in this system is under a slight vacuum. In this way the knocking and hissing of radiators is avoided. *Hot-water* systems are similar to steam systems, but instead of steam being generated in the boiler, a volume of hot water is heated and circulates, by convection, to all parts of the house. It begins to supply warmth, therefore, long before the boiling point is reached, which gives it an advantage over the steam system. More radiating surface is required, however, to give the same heating effects. The *gas-steam* radiator is a

miniature boiler and radiator combined. At the base of the radiator is a reservoir of water, heated by gas nets. When steam is formed, the pressure automatically lowers the gas flame, so that the temperature is kept practically constant. The *boiler-radiator* is similar in principle, but coal is used in place of gas, and, if required, connecting pipes will carry the hot water to radiators in adjoining rooms. The system is of value for small houses or bungalows which have no cellars. *Electric heating* is too expensive for general use, but is employed for heating street cars and electric trains, and also finds application in small domestic heaters for occasional use.

Ventilation. The value of a sufficient supply of fresh air is becoming recognised to an increasing degree. The owners and designers of factories, offices and workshops are realising that expenditure on ventilating systems is true economy, resulting in better work and less loss of time through sickness. The well-known effects of bad ventilation, including headache, lassitude and decreased resistance to disease, are due to the poisoning of the air by the carbon-dioxide exhaled from the lungs. It is estimated that an adult person requires 3,000 cubic feet of air per hour. In actual practice, it is found that 250-300 cubic feet of air space is sufficient. This is due to the constant supply of fresh air which must occur even in a room with closed doors and windows and no special ventilating device. The room of the ordinary dwelling is, of course, far from being hermetically sealed. The leakage around doors, windows and by the chimney is enormous. There is, therefore a danger of over enthusiasm in the matter of ventilation, and it should be taken as a fundamental rule that when the current of fresh air is sufficient to be perceptible and to produce unequal cooling of the air, either the system is at fault or the ventilation is excessive. The opening of windows, top and bottom, is the simplest form of ventilation. More elaborate systems, involve the use of fans or air pumps, and sometimes, in large public buildings, the air is carefully filtered and cleaned by passing through canvas or cotton, and then either cooled or heated according to conditions, and pumped through pipes to different parts of the building.

HEAVEN, the firmament, or empyrean; the atmospheric region, and the space in which the sun, stars, and planets are seen; the abode of God; the dwelling-place of the blest; a state of supreme happiness, etc.

HEBBURN (54° 58′ N., 1° 45′ W.), town, Durham, England; shipbuilding yards. Pop. 22,000.

HEBE (clasical myth.), *d.* of Zeus and Hera; cup-bearer to the gods; subsequently became wife of Hercules; gave place to Ganymede. She is usually represented as a beautiful maiden, bearing wine-cup and pitcher.

HEBER, REGINALD (1783-1826), Eng. hymnologist; bp. of Calcutta 1822; a man of great learning and piety; now chiefly remembered by his hymns, *From Greenland's Icy Mountains*, etc.

HÉBERT, JACQUES RENÉ (1757-94), Fr. revolutionary; led sect of *Hebertistes* against the *Girondins*; edit. *Le Pere Duchesne*; instigated September Massacres; guillotined.

HEBREW LANGUAGE AND LITERATURE belongs to the Canaanitish branch of the Semitic group of languages, and approximates closely to Phoenician and Moabite, with which it shares the following characteristics; two genders, three-consonant roots, an inability to form compounds except in the case of proper nouns, two tenses in verb, imperfect and perfect, changed by prefix *we* into aorist and future. The ancient angular type of lettering was replaced by square characters written from left to right, while the vowels were—if indicated at all—represented by 'points', a system now elaborated by scholars and called the *Massoretic* punctuation (see H. Literature). Hebrew was after the Exile replaced as spoken language by Aramaic, but it still persists as literary and cultured tongue, while modern vernacular is called 'Yiddish.'

Literature.—Hebrew literature is almost entirely based on the Old Testament, which comprises the highest literary productions of the race for a period of about 800 years. There are exhibited in the course of it not only the normal changes which such a lapse of time always makes in a language, but deeper-cutting differences—*e. g.* in Daniel, Chronicles, Nehemiah, and Ecclesiastes there is a very large proportion of Persian words. Yet there is a distinctly unifying tendency noticeable over the whole, and this is especially true of the Psalms, which do not probably belong to any particular period, but are a collection of slow and gradual growth. The most recent portions of the Old Testament are those mentioned above (330-160 B.C.), the oldest being parts of the Pentateuch (*c.* 800 B.C.). The later form of the language, Aramaic, with its admixture of Persian elements, became the common language of the people, and the older portions were, about the III.

cent. A. D., in great part translated into this vernacular for use in the synagogues. This forms the *Targum*. Another process came into being, of amplification, especially of the Mosaic Law, not only that given in the Pentateuch but of the Oral or Traditional Law, which had been handed down among the elders; this compilation formed the *Halakhah*, and was collected in written form by Judah-he-Nasi in the *Mishnah*. Side by side with this there grew up a mass of expository writings which received the name of *Midrash*, and the compiling of which went on till the VIII. cent. As time wore on, these explanatory works themselves became the subject of critical commentary out of which grew the *Talmud* (first edition, Venice, 1520). So far most of the work had been a mere collection of anonymous commentaries, but from the XV. cent. onwards Hebrew literature acquired a more personal character. The Hebrew historians and theologians began to publish—such as Elias Levita, Dei Rossi, Joseph ben Joshua, Moses Cordovero, and, in the XVII. cent., Leon di Modena and David Conforte. In addition to these works, which were mainly of a historical and scientific nature and possess no striking literary merit, the liturgical literature grew steadily in volume.

Moses Mendelssohn, at the close of the XVIII. cent., attempted to tear Hebrew literature out of its groove and infused it with a new and more practical spirit. His great work, the German translation of the Pentateuch, marked, however, in reality the end of purely Hebrew writings. Henceforth, though Hebrew thinkers and scholars were to contribute powerfully to modern culture, they used the various European languages as the vehicle of their thought.

Hebrew Religion.—It is impossible in the present state of our knowledge to give a complete account of Hebrew religion, as the materials for it are not adequate, being many of them of uncertain, and all of comparatively late date. Somthing, however, is known of primitive H. r. by archaeology, and something more may be learnt by the comparative method. The evidence of the Tell-el-Amarna tablets shows that from 2000-1400 B.C. the Hebrews were much under Babylonian influence, and until about 600 B.C. they were merely one of a congeries of Semitic tribes closely akin not only in blood and language, but also in religion, There were probably tribal deities, much as in Arabia before Muhammad. Little can be said with certainty of H. r. before Moses, but then there was at any rate some progress in the direction of monotheism, though as yet only monolatry was attained.

The cult of Jahweh, Israel's god, was, however, purer than that of other Semitic deities, though when the Hebrews entered Canaan they took over some religious ideas and practices from the peoples whose land they conquered. The impure rites against which the prophets inveighed were not a native Hebrew growth. But the conflict between Israel and the neighbouring peoples developed a new order—the prophets. At first they were only *seers*, those possessed of 'second sight'; then they became the witnesses and declarers of God's will to men. Prophecy was one of most remarkable developments of the Hebrew religious genius, and one which marked it off from other peoples, whose religion started similarly, but failed to rise to any great height. In the VIII. cent. Amos and Isaiah denounced a religion merely of rites and sacrifices, and preached gospel of righteousness—the religion as something largely ethical was only just beginning to emerge. But higher spiritual results could not be attained before the national kingdoms of Israel and Judah had been overthrown and the peole had endured the weary discipline of the Exile.

The religious teaching of Jeremiah and his career present, it has been said, as close a parallel to that of Christ as any in the Old Testament. Religion, too, became more individual, and the feeling of personal responsibility to God was realised; 'The soul that sinneth it shall die.' The conception of the 'suffering servant' (*i.e.* the Hebrew nation) was evolved. Meanwhile the turning-point in religious history was the reformation under King Josiah, 621 B.C., when was established the 'Law of the One Sanctuary'. Henceforward people had to come up to Jeruslaem to sacrifice, and about this time the Book of *Deuteronomy* was produced. Though these tended in some ways to a too *legal* religion, it was probably only thus that monotheism could be safely secured. After the return from Exile the reconstruction of religion in the restored nation was largely due to Ezekiel, who with the functions of a prophet also combined those of a priest. The elaborate sacrificial system which was to last till the destruction of the Temple was organised, and during the V. cent. the so-called Priestly Code, the latest embodiment of Hebrew ritual, was evolved.

From this period until the time of Christ several important developments took place. H. r. became intensely legal, and its idea of God transcendent. The nation passed through the fiery trial of the conflict with debased Hellenism under the Seleucid kings, and was brought through by the energy and

devotion of the Maccabees (to this date some would assign many portions of the Book of *Isaiah* often thought to be earlier). The Exile left its mark on Hebrew theology, particularly in angelology; eschatology became prominent, and various conceptions of a coming Messiah floated in men's minds. Each of these was destined to have enormous effect on early Christian theology; the genesis of the ideas is in some cases uncertain, but the ideas of angels and of a resurrection were due to Zoroastrian influence, and the various woes through which Israel had passed gave rise to the longing for a better age. In the *Book of Enoch* the Messiah is pre-existent—an important development. Hebrew thought also came into contact with Gk. philosophy, so the 'Wisdom' literature was written, and the curious tendency to personification or semi-personification of divine attributes and spiritual forces, 'half persons and half powers,' resulted from this or other causes. Thus H. r. at the time of Christ, while retaining its ancient sacrifices and traditions, was a complex thing, in which various elements were mingled.

HEBREWS. See Jews.

HEBREWS, EPISTLE OF THE, one of the most important N. T. writings. The epistle is anonymous, and although many conjectures have been made, the authorship has not been established. It is certain that the author was a Jew who had a knoweldge of Jewish and Gr. literature and of contemporary philosophy. According to an old theory, the author was Luke; Apollos, suggested by Luther, may be nearer the truth; Tertullian refers to epistle and says it is the work of Barnabas; Harnack's view that it was written by Aquila and Priscilla is the most likely. There is no direct evidence to whom it was sent; the conjecture is that it was written to a Jewish Christian community, most probably in Rome, for the purpose af defending Christian belief and hope. There was an urgent danger that those to whom the author was writing were falling away from Christianity; he exhorts them to hold fast and cultivate patient endurance and faith, imitating the heroes of the faith and looking unto Jesus. Christianity is the perfect and therefore final religion, because it brings free access to God.

The date of the epistle is about A. D. 70.

HEBRIDES, NEW. See New Hebrides.

HEBRIDES, THE, OR WESTERN ISLES (57° 45′ N., 6° 50′ W.), large group of islands extending over 200 miles along W. coast of Scotland; area, *c.* 2810 sq. miles; divided by Little Minch into Outer Hebrides, consisting of, from N. to S., Lewis and Harris, N. and S. Uist, Benbecula, and numerous islets; and Inner Hebrides, consisting of Skye, Rum, Eigg, Canna, Coll, Tyree, Mull, Ulva, Staffa, Iona, Colonsay, Jura, and Islay. Scenery is wild and picturesque; climate mild and moist; industries—sheep-rearing, fishing, fowling, tweeds. The Hedridges were ceded by Norway to Scotland, 1266; subdued by Lord of the Isles, 1346; annexed to Scot. Crown, 1540.

HEBRON (31° 31′ N., 35° 8′ E.), town, Palestine; has enclosure built over rock cave, which is traditional tomb of Abraham and other patriarchs. Pop. *c.* 10,000.

HECATÆUS OF ABDERA (IV. cent. B.C.), Gk. philosopher; a source of Diodorus Siculus.

HECATÆUS OF MILETUS (*c.* 550-470 B.C.), Gk. historian and geographer; wrote *Travels about the Earth* and a hist. work in which he endeavored to separate mythology from fact; latter contained in Müller's *Fragmenta Historicorum Groecorum.*

HECATE (classical myth.), *d.* of Perses and Astraea, sometimes identified with Persephone; was the goddess of witchcraft and enchantments, also of fertility, her power extending over heaven, earth, and hell. She was sometimes represented as triple-bodied, at other times as a tall woman,with sword and torch. Dogs and black lambs were sacrificed to her.

HECATOMB, the sacrifice or slaughter of many victims;amongst the ancient Greeks and Romans, sacrifice of one hundred oxen.

HECHT, BEN. (1893), author; *b.* in New York City. Educated at Racine, Wisconsin High School. Started in 1910 with Chicago Journal, since 1914 with Daily News. From 1918-1919, correspondent in charge of Berlin Office, Daily News. Writes short stories for magazines.

HECKER, FRIEDRICH FRANZ KARL (1811-81), Ger. revolutionary; member of Baden Chamber of Deputies, 1842; with object of founding Ger. republic, raised military force against government, but was defeated, 1848, withdrew to Switzerland; subsequently served on Federal side in Amer. Civil War.

HECKER, ISAAC THOMAS (1819-88), Amer. R. C. evangelist; of Ger. parentage; became R. C., 1844; entered

Redemptorists; ordained priest, 1849; undertook evangelisation of America, realising it must be by Amer. methods; went to Europe, 1857; provoking hostility of anti-republicans and those who imagined he would 'liberalise' Church; but H. was a quite orthodox Catholic.

HECLA, HEKLA. See VOLCANOES.

HECTOR (classical myth.), Trojan hero; *s.* of Priam and Hecuba, husband of Andromache, *f.* of Astyanax; killed Ajax in single combat, and slew Patroclus; was himself afterwards slain by Achilles.

HECUBA (classical myth.), wife of Priam, king of Troy; at the fall of the city became the spoil of Odysseus; subject of a tragedy by Euripides.

HEDGE, feature of agriculture now largely giving place to the fence. Hedging and ditching at the king's command were among the duties of the Anglo-Saxon thegn.

HEDGEHOG OR URCHIN (*Erinaceus*), a short-snouted Insectivore characterised by spiny covering and short tail; nocturnal; feeds on worms, lizards, snakes, eggs, and even rats and mice; hibernates in winter.

HEDIN, SIR SVEN ANDERS (1865), Swed. Asiatic explorer; travelled extensively in the East, but first gained his reputation by crossing the Pamirs in the depth of winter, 1893; crossed the desert of Takla-Makan, nearly losing his life, 1895; floated down the Tarim, 1899 and solved the problem of Lobnor; he dug out of the sand evidences of Chin. civilization of the 3rd cent.; subsequently explored in Persia and Tibet; discovered a great range in the N. of the Himalayas 1907-8, which was named after him the Hedin Mts. During early months of World War acted as correspondent for Swed. press with the Ger. armies.

HEDJAZ. See HEJAZ.

HEDONISM, ethical theory which may be of two kinds—(1) that every man makes pleasure his goal; (2) that pleasure is the only ultimate good. The ancient Cyrenaics and (differently) Epicureans were hedonists.

HEEL, back division of foot; possibly regarded as hinge in walking, hence to h. over, to turn; anything that covers the h.

HEEM, JAN DAVIDSZ VAN (fl. XVII. cent.), Dutch painter; chief painter of flowers, insects, glass, and similar still-life studies, of his school. His *s.*, Cornelius fl. XVII. cent., was a lesser master in the same kind.

HEEMSKERK, MARTIN JACOBSZ (1498-1574), Dutch religious painter of Ital. school; many of his principal works were burned at Haarlem in 1572; those left are remarkable for sculpturesque figures.

HEFLIN, JAMES THOMAS (1869), United States Senator. *B.* in Alabama Educated at Southern University and A. and M. College. In 1893 was admitted to bar. Mayor of Lafayette for two terms. From 1894-1896 register in chancery. Was member from 1986-1900 of Alabama House of Representatives. 1896-1902 member of Democratic State Executive Committee. Secretary of State, 1902-1904. Elected to Congress in 1904 for unexpired term. Re-elected for term 1915-1921. Resigned Nov. 1, 1920 and elected next day as United States Senator.

HEGEL, GEORG WILHELM FRIEDRICH (1770-1831), Ger. philosopher, founder of Absolute Idealism; *b* Stuttgart; ed. Tübingen Univ.; went to Jena, 1801, and app. prof., 1805. In 1808, app. rector at Nuremberg gymnasium; prof. at Heidelberg, 1816, and at Berlin, 1818. Henceforth the leading philosophic thinker in Germany. Chief works, *Phenomenology of Spirit*, 1807; *Science of Logic, Encyc. of Philos. Sciences, Philosophy of Rights*, 1821; and the posthumous lectures of *Aesthetics, Phil. of Religion*, and of *History*.

HEGESIAS OF MAGNESIA (fl. III. cent. B.C.), Gk. orator; much condemned in the Augustan Age; author of life of Alexander the Great.

HEGESIPPUS (fl. IV. cent. B.C.), Athenian statesman.

HEGEMON OF THASOS (V. cent. B.C.), Gk. comic writer; praised in Aristotle's *Poetics*.

HEGEMONY (Gk. *hegemonia*, leadership), primacy of one state in a federation, *e.g.* pre-eminence of Athens in the Delian Confederacy

HEGESIPPUS (fl. II. cent.), patristic writer.

HEGESIPPUS, putative author of *De Bello Judaico*, IV.-cent. rendering of Josephus.

HEIDELBERG. City, Baden, Germany (49° 24′ N., 8° 42′ E.), beautifully situated on Neckar, near Rhine, surrounded by hills covered with forests and vineyards. St. Peter's Kirche (15th cent.), Gothic Heilige-Geist-Kirche, Jesuiten-Kirche; town hall; fine castle on hill, 330 ft. high, with great vat capable of holding 50,000 gallons of wine; cele-

brated univ. 1385; beer, wine, and book industry; scientific instruments; residence of counts palatine (*c.* 1155-1721); great centre of Ger. Calvinism; sacked by French 1688, 1693; annexed to Baden, 1903. Pop. 56,000.

HEIDELBERG (26° 30′ S., 28° 20′ E.), town, Transvaal, Brit. S. Africa. Pop. 40,000.

HEIDELBERG CATECHISM, THE, Prot. catechism compiled by order of Elector Frederick III. in 1563, by Zacharias Ursinus and Caspar Olevianus; accepted by Heidelberg synod, but attacked by extreme Lutherans; on somewhat different lines from most catechisms, it possesses great spiritual beauty, and has been often translated.

HEIDELBERG UNIVERSITY, Ohio, a seat of learning for both sexes situated at Tiffin. It dates from 1890, when the college from which it sprang, founded in 1850 by the Reformed Church, was reorganized. The liberal arts are taught, as well as theology, commerce, art and music, and it has preparatory and summer schools. In 1922 there were 404 students and 30 teachers headed by C. E. Miller.

HEILBRONN (49° 8′ N., 9° 13′ E.), town, Württemberg, Germany; has XI.-cent. Ghotic church and other interesting buildings; industrial centre. Pop. 45,000.

HEILPRIN, ANGELO (1853-1907), an American scientist, born in Hungary, but came to U. S. in 1865. Educated in Europe. Professor of paleontology and geology at Academy of Natural Science, Philadelphia, 1880. Went on Peary Relief Expedition, 1892, and travelled extensively in America and Africa for scientific research. Was present (1902) in Martinique at the time of the eruption.

HEINE, HEINRICH (1797-1856), Ger. poet; *b.* Düsseldorf, of Jewish parents; studied law at Bonn, Göttingen, Berlin; adopted Christianity, 1825; pub. *Reisebilder*, 1826; *Buch der Lieder*, 1827, which made him the most popular poet of Germany; visited England, 1837; *Engliche Fragmente* appeared, 1831. H. settled in Paris, 1831; after unhappy love affairs with his cousins; to this period belong *Franzosische Zustande*, 1833; *Der Salon*, 1834; *Ludwig Borne*, 1840; *Die Romantische Schule*, 1836 (prose works); *Atta Troll*, 1847; *Romancero*, 1851 and *Letzte Gedichte und Gedanken*, 1835, 1855, rank among his finest poetical works; bedridden, 1848-56; *d.* Paris. H. ranks as perhaps the most cosmopolitan Ger. poet; belongs partly to Romantic movement, partly to 'Young Germany' revolt; great lyric and *spiritual* writer.

HEINTZELMAN, STUART (1876), Army Officer. *B.* in New York City. Graduated from United States Military Academy, 1899 and 1905, honor graduate of Infantry and Calvary School. In 1899 second lieutenant of cavalry, 1st lietenant, 1901, Captain, 1905, Major, 1917, Lieutenant Colonel, 1917; Colonel Regular Army, 1920. In Philippines 1900-1902. From 1907-1909 with China Relief Expedition, 1909-1912, 1914-1916 instructor in Army Service Schools. In France, 1917, September, 1920 appointed assistant chief of staff, director military intelligence. Awarded Distinguished Service Medal and decorated by France and Italy.

HEIR, originally inheritor in fee (*h. at law*), afterwards inheritor, next of kin, or devisee. *H. apparent* is person who will inherit if he lives; *h. general* is h. at law; h. *presumptive*, person who will inherit if conditions remain the same; *right h.* is next of kin.

HEJAZ, kingdom of Arabia, on the shores of Red Sea (25° N., 38° E.), bounded N. by Syria, E. by Nefud desert and Nejd, S. by Tehama. Contains Tehama range of mts., and is almost all stony desert; N. portion desolate and thinly populated; in S.more cultivation, dates, wheat, and barley being chief products. Chiefly interesting on account of sacred cities of Mecca and Medina, which it contains along with seaports Jiddah and Yambu; railway connecting cities of Hejaz with Damascus under construction, and completed as far as Medina in 1908. After the participation of Turkey in the Great War, 1915, this region was the scene of severe and prolonged fighting. For recent history, see Arabia and Hussein Ibn Ali. Area, 96,500 sq. m.; pop. 300,000.

HEKLA. See Volcanoes.

HEL, HELA, the goddess of death in Scandinavian mythology; *d.* of Loki and Angurboda; to her went all who died by disease; dwelt in Nifiheim, place of eternal snow and darkness.

HELDENBUCH, DAS, Ger. poetic cycles of XIII. cent.; chief figures are Dietrich of Bern, Wolfdietrich, Hugdietrich, and Ortnit. The first printed edition appeared without date, the second, 1491; many modern edit's.

HELDER, THE (52° 57′ N., 4° 45′ E.), port, Holland; strongly fortified. Pop. 1921, 28,818.

HELEN OF TROY (classical myth.), *d.* of Zeus and Leda, wife of Tyndareus, king of Sparta; famed for her beauty; became the wife of Menelaus, but eloped

with Paris, *s.* of Priam, king of Troy, which act led to the Trojan War.

HELENA, a city of Arkansas in Phillips co., of which it is the county seat. It is on the Missouri and Northern Arkansas, the Iron Mountain and Southern, and other railroads, and on the Mississippi River, 90 miles S.W. of Memphis, Tenn. It is connected by steamship lines with all the important river ports and is a shipping point for lumber and cottonseed oil. Its industries include the manufacture of cottonseed oil, boxes, cotton goods, machinery, canned goods, and lumber. It has a public library, Jefferson High School, Sacred Heart Academy, and a national bank. Pop. 1920, 9.112.

HELENA, a city of Montana in Lewis and Clarke co., of which it is the county seat. It is on the Great Northern, and Northern Pacific railroads. Helena is the commercial and business center of Montana, Northern Idaho, and Eastern Washington. It has abundant water power from the Missouri River. It is important industrially and has smelting and reduction works, blast furnaces, foundries, machine works, granite and sandstone works. It also has large interests in farming and stock raising. It is the seat of several educational and other institutions, including Montana Wesleyan University, Mount St. Charles College, St. Vincent's Academy, Orphans' Home, St. Peters and St. Johns hospitals. Among the important public buildings are the State Capitol, and the Federal buildings. The city is connected with neighboring town by electric railway. Pop. 1920, 12,037.

HELENA, ST. (*c.* 247-328), wife of Rom. emperor Constantius I., and *m.* of Constantine the Great; accepted Christianity and made pilgrimage to Jerusalem, where she is said to have discovered the Cross and built churches of the Holy Sepulchre and Nativity.

HELENA, ST. See ST. HELENA.

HELENUS, *s.* of Priam; mentioned in the *Iliad,* and prominent character in later Gk. legend.

HEINRICH, KARL (1873), Ger. financier; was a prof. of political economy in Berlin Univ., entered Foreign Office, 1901 as an expert in colonial affairs and economics; he took a prominent part in connection with Anatolian Ry. concession, and became director of Deutsche Bank, 1908. Shortly after outbreak of World War he was made secretary to Imperial Treasury, in which capacity he created vast amounts of paper money, and skilfully contrived to bolster up successive war loans by transferences of 'paper.' His finance was based on expectations of huge indemnities from vanquished, and though his dexterous handling of facts and figures sustained for a time public confidence in Germany in her 'inexhaustible resources,' he could not prevent steady fall of mark on foreign exchanges. In 1916 he became secretary of state for the interior, and deputy imperial chancellor, but resigned towards end of 1917. He was Germany's chosen negotiator of economic terms for her enemies, and, as ambassador to Russia 1918, was real author of supplementary treaties imposed on Bolshevists; pub. a book on origin of the war, 1919.

HELICON (38° 17′ N., 22° 53′ E.); mountain range, Boeotia, Greece; traditional home of Muses.

HELICOPTER. This name is applied to a type of flying machine, heavier than air, capable of raising itself vertically in the air, by means of propellers turning on vertical axes.

The scientists of the eighteenth and nineteenth centuries were much interested in this type of machine, and made many models in an attempt to demonstrate the practicability of their ideas. Such men as Sir George Cayley, J. Degen, Sarti Stringfellow and many others gave much attention to this branch of aeronautics, believing that it was the only solution to the problem of aerial navigation.

The name Hélicoptére was first associated with the model of Penaud, 1872, which depended for its lifting power on 'vertical screws'. Many elaborate models were built after this, utilizing springs, twisted elastic bands, and even steam engines as their source of power. All were unsuccessful. Some were too heavy to rise from the earth and many that were light enough to be lifted were so frail that they were shattered on coming to earth after their driving power had expended itself. About this time similar machines with flapping wings were tried and proved equally unsuccessful. Although the present day inventors have not neglected this type of flying machine, a successful one has still to make its appearance.

HELIGOLAND, OR HELGOLAND isl., Germany, North Sea (54° 11′ N.; 7° 52′ E.), 28 m. from mainland; triangular in shape, rising to 200 ft.; consists of Unterland and Oberland, connected by a wooden staircase; Dünen I. (lower isl.), separated from Rock I. by violen storm, 1720, contains land-locked harbor capable of sheltering large ships; also formerly famous seaside resort; once possessed by Schleswig-Holstein; taken by

Danes, 1714; by British, 1807; ceded to Germany, 1890. Area, ¾ sq. m.; pop. formerly 3,500. Heligoland was powerfully fortified by Germany at cost of many million dollars. During World War formed a forward base for Ger. fleet; by Peace Treaty (June 28, 1919) fortifications, harbors, and military establishments were destroyed, and defences prohibited for the future.

HELIGOLAND BIGHT, BATTLE OF (Aug. 28, 1914), earliest naval action of World War, undertaken to assert our command of the North Sea up to the enemy's gates; Germans had wind of operation, and planned counter measures *Arethusa* and *Fearless*, leaders of 1st and 3rd flotillas respectively, engaged several enemy light cruisers; Brit. 'Cat Squadron', under Admiral Beatty, came to rescue, and destroyed or finished off three German light cruisers. *Mainz*, *Koln*, and *Ariadne*; Germans also lost a destroyer. Brit. loss did not exceed 35 killed and 40 wounded; Germans lost well over 1,000. No Brit. vessel sunk. Battle had great deterrent effect on enemy.

HELIODORUS (fl. *c.* III. cent. A.D.), author of the *Aethiopica*, a Gk. story which had great influence on Renaissance writers.

HELIOGABALUS, ELAGABALUS (*c.* 205-22), Rom. emperor; became priest to sun-god Elagabal; emperor, 218; assassinated during army mutiny, 222.

HELIOGRAPH, signalling instrument that reflects sun's rays by mirrors; range of 190 miles has been reached.

HELIOMETER is an instrument used for measuring the sun's diameter and for micrometrical work on the stars. It is based on the fact that measures can be made by double images. The heliometer consists of an *achromatic* telescope with its object glass divided (by a plane passing through the optic axis of the telescope) into two segments, one fixed in the telescope tube, the other mounted so that it can be moved in a plane perpendicular to the telescope's optic axis. The movement is obtained by the revolution of a screw connected with an apparatus for counting the revolutions. In very recent heliometers this reading is checked independently by a *micrometer* which measures directly the separation of the segments. From two measurements the actual diameter can be calculated. Recent modifications of the apparatus aim at increasing facility of movement and avoiding the effects of temp. changes.

HELIOPOLIS (the On of the Bible), city of Lower Egypt, near Cairo, slightly N. of the Nile Delta; was one of the principal centres of sun-worship and of Egyptian learning. H. was also the name of Baalbek.

HELIOSCOPE, a kind of telescope, particularly adapted by means of blackened or smoked glasses which only partially reflect the light, for viewing the sun.

HELIOSTAT, instrument for reflecting a beam of sunlight in a fixed direction. A mirror is mounted on a spindle driven by clockwork whose rate can be adjusted. The clockwork case is so arranged as to allow the initial adjustment to be made.

HELIOTROPE, a plant with a sweet scent, belonging to a genus of 200 species of the natural order *Boraginaceae*. They are small hairy shrubs. Heliotrope (*Cherry-Pie*) has terminal *spikes* of lilac flowers.

HELIOTROPISM, turning of a plant towards light; stems curve towards sun (*positive h.*), roots and stems of certain climbers turn away from sun (*negative h.*).

HELIUM. A gaseous element with an atomic weight of 3.99, being the lightest of the known elements with the exception of Hydrogen, which has the atomic weight 1.00. It was discovered in the sun, by means of the spectroscope, long before its existence on the earth was demonstrated. The discovery was made by Jannsen and Lockyer in 1868 and it was later found, by Ramsay, in the gases evolved from the mineral cleveite. It also occurs in the air to the extent of about one part, by volume, to 250,000 parts of air. It is believed to be the final product in the disintegration of radium, the so-called alpha rays having been identified by Ramsay as particles of helium. Because of its lightness and its non-inflammability and general chemical inertness, the suggestion was made by English chemists during the European war, that it should be used in place of hydrogen for filling airships and balloons. Up to that time, however, it had been prepared only on a laboratory scale, and there was no known source of supply from which it could be obtained in large quantities. The co-operation of the U. S. Bureau of Mines was sought, and under their direction the Jeffries-Norton and Linde processes for the extraction of helium from natural gas were developed. The principal constituents of natural gas are nitrogen, methane and helium, and the separation of the gases is brought about by freezing to extremely low temperatures. At 318° F. below zero, nitrogen and mehtane become liq-

uified, while helium remains in a gaseous condition. The separation then becomes an easy matter, the helium being drawn off from the liquid gases. The process was developed too late to be of value during the war, although when the Armistice was signed quantities of the gas were awaiting shipment to France. Since the war, however, considerable experimental work has been carried out with the gas, and the results are considered satisfactory. Although helium is denser than hydrogen, its greater safety more than counterbalances the loss in buoyancy.

HELL, the abode of the dead; also the place of punishment of the wicked, numerous times mentioned in the New Testament. Alternative names are the Gk. *Hades*; Heb. *Gehenna*; Scand. *Hela*.

HELLANICUS OF LESBOS (V. cent. B.C.); Gk. historian; wrote history of Attica, 683-404; a chronological work on the Carnean games· also histories of Troy and Persia.

HELLEBORE is a genus of herbs belonging to natural order *Ranunculaceoe*. —Hellebore (*Christmas Rose*) has five or more petaloid speals. The 'petals' are slipper-shaped *nectaries*. The stigma ripens first (*protogynous*) and self-pollination is impossible. The fruit is an aggregation of three *follicles*.

HELLENISM, a type of culture peculiar to the ancient Greeks. The Gk. character as reflected in Hellenic religion, poetry, art, and philosophy makes for clearness, measure, and balance, and eschews the vague, the undefined, the excessive. The Gk. ideal is therefore the antithesis to the Gothic. In architecture the Gothic mind expressed itself in soaring arches and mysterious curves. The Gothic mythology deals with vast, titanic, cloud-like beings, neither human in character nor restricted in power. The Gk. mind is well illustrated by the motto of the ancient Delphic temple, 'Nothing in excess.' In Gk. mythology the outstanding characteristic is the extraordinary definiteness of the gods and goddesses. Each god has his peculiar attributes, his fixed bodily shape, and his allotted functions. Mystery has no place in the Gk. Pantheon. Similarly in philosophy the theory that virtue lies in preserving the 'mean' is characteristically Gk. Thus bravery is regarded as a mean between rashness on the one hand and cowardice on the other.

HELLER, EDMUND (1875), Naturalist. *B.* in Illinois. Bachelor of Arts of Stanford College in 1901; assistant naturalist, United States Biological Survey, Alaska. Naturalist of Field Museum, Chicago explorations from 1901-1907 in California, East Africa and Mexico. 1907-1908 at University of California Museum of Natural History; curator of Mammals. Under direction of Theodore Roosevelt, naturalist for Smithsonian Institute. In East Africa, 1909-1901. 1911-1912 with Rainey African Expedition in East Africa. Under auspices of National Geographic Society and Yale University; with Peruvian Expedition in 1915. 1919-1920 Cape to Cairo Expedition of Smithsonian Institute.

HELLESPONT, ancient classica. name of the Dardanelles, the strait connecting the Sea of Marmora and the Ægean Sea; so called from Hellé, *d.* of Athamas and Nephele, who, fleeing from the cruelty of her stepmother, Ino, fell from the air into the strait and was drowned.

HELL GATE, a narrow pass in the East River, New York City. It was formerly dangerous for navigation but by extensive submarine mining operations, the obstructions have been removed and it is now navigable by vessels of large tonnage.

HELLIN (38° 29′ N., 1° 38′ W.), town, S.E. Spain. Pop. 12,500.

HELMET, headpiece in armor. Early h's were simply caps made of leather or metal, with attachments for protection of face and neck. In mediaeval times some h's had a fixed nasal, while others had movable covers for protecting both upper and lower face, the whole head being covered during action. In XIV. cent. barred visors came into use. The *armet* first appears about 1443, and was a closed h., used only by horsemen. The XVI.-cent. *morion* had a projecting brim. Modern h's worn by policemen and firemen are made of metal, felt, leather, or cork. The use of helmets in the shape of steel hat was revived in the armies of all the principal countries in the World War.

HELMHOLTZ, HERMANN LUDWIG FERDINAND VON (1821-94), Ger. philosopher and physicist; prof. of Physiology in Heidelberg, and later of Physics in Berlin. He discovered nerve-cells in *ganglia*, invented the opthalmoscope, and measured the velocity of nervous impulse. It was by his inspiration Hertz commenced his work, which resulted in discovery of 'Hertzian' waves of wireless telegraphy. H. also perfected notion of electron.

HELMOND (51° 28′ N., 5° 39′ E.), town, Holland. Pop. 15,000.

HELMSTEDT, HELMSTADT (52° 13′ N., 11° E.), town, Brunswick,

Germany; ruined Benedictine abbey, fine churches; seat of univ. till 1809. Pop. 16,000.

HELMUND (31° N., 61° 50′ .E), river, Afghanistan; has its source in Hindu Kush Mountains and flows to Lake of Hamun or Seistan.

HÈLOISE. See ABELARD.

HELOTS, the ancient serf population of Greece and the property of the Spartan State. They are supposed by some authorities to have been the original inhabitants of Laconia. They were employed in agricultural pursuits by the Spartans, and in war were required to perform military service. A revolt of the h's, in 464 B.C., was with difficulty suppressed.

HELPER, HINTON ROWAN (1829-1909), an American writer, *b.* in North Carolina. For a time he lived in California. He was brought into great prominence by his *The Impending Crisis of the South,* published in 1857, an anti-slavery work. He published other works which had less success. From 1861 to 1867 he was United Stages consul at Buenos Aires.

HELPS, SIR ARTHUR (1813-75), Eng. essayist and historian; Clerk to Privy Council 1860-75; author of *Friends in Council, Companions of my Solitude, Conquerors of the New World,* etc.

HELSINGBORG (56° 2′ N., 12° 42′ E.), port, Sweden; fine harbor, docks; manufacturing centre. Pop. 1921, 47,074

HELSINGFORS, cap. of Finland, on Gulf of Finland (60° 14′ N., 24° 57′ E.); splendid harbor, strongly guarded by fortress of Sveaborg; exports timber, corn, and butter; manufacturers sugar, beer, linen, tobacco, etc.; has a univ. and cathedral, and is seat of government of republic of Finland. During spring of 1918 a good deal of street fighting took place in town between Red and White Guards, the latter triumphing through Ger. aid. See FINLAND. Pop. 1919, 188,922.

HELVETIC CONFESSIONS, ecclesiastical constitutions of Reformed Churches; drawn up in Switzerland; that of 1536 was prepared under influence of Bullinger and Bucer but was largely superseded by the second H.C., written by Bullinger in 1562.

HELVETIC REPUBLIC was established in Switzerland, 1798, after conquest by French.

HELVETII, inhabitants of S. Gaul (modern Switzerland). Caesar praises their bravery. Their invasions of Italy were suppressed by Caesar's victory at *Bibracte* and the establishment of Rom. colonies. They were separated from Gaul by Tiberius. The H. gave name Helvetia to Switzerland.

HELVETIUS, CLAUDE ADRIEN (1715-71), Fr. philosopher; became farmer-general of taxes, 1738, gaining great wealth; retiring to country estate, wrote *De l'esprit,* which evoked storm of abuse. Many have denied its originality. Bentham was influenced by him. H.'s view of morals was utilitarian.

HELY-HUTCHINSON, JOHN (1724-94), Irish lawyer and politician; entered Irish Parliament, 1759; provost of Trinity Coll., Dublin, 1774; Sec. of State, 1777; advocated removal of Catholic disabilities, and free trade.

HELYOT, PIERRE (1660-1716), Fr. Franciscan historian; devoted many years to writing standard celebrated *Histoire des Ordes monastiques, religieux, et militaires.*

HEMANS, FELICIA DOROTHEA (1793-1835), Eng. poet; *b.* Liverpool; *m.* Captain H. 1812; but separated 1818. Her poetry is marked by excess of sentiment.

HEMEROBAPTISTS, Jewish sect (possibly Essene), whose members observed daily ablution.

HEMICYCLE, semicircular plan characteristic of Rom. architecture and readopted at the Renaissance.

HEMIPTERA, OR BUGS, are *Insecta* invariably characterised by modification of mouth organs to form a suctorial, jointed proboscis, generally flexed so as to occupy a position on under side of body. The wings are four in number as a rule, and are external growths developed in successive moults from the hinder dorsal portions of the middle and posterior body-segments. They differ considerably in character in the two great sub-orders, *Heteroptera* and *Homoptera,* the pairs varying in texture and folding flat on the back in the former, and in the latter covering the abdomen. The two sub-orders are further distinguished by the extent of the flexure of the head, this being much less in the *Heter.* than in the *Homo.* The young resemble the adult in general features, the transition from the juvenile to the adult being gradual. Amongst the most interesting forms, from an economic standpoint, are the *Aphides* or *Plant Lice,* which often swarm in incredible numbers over the host plant, and the scale insects or *Mealy-bugs,* which form small hard scales on fruit, twigs, etc. The *Anopleura* (Lice) are degenerate wingless members of this order.

HEMISPHERE, a half sphere. It is applied especially to one of the halves in which the earth may be supposed to be divided.

HEMLOCK, a herbaceous plant, *Conium Maculatum*, natural order *Umbelliferoe*, with white *inflorescence* of compound umbels and purple-spotted fluted *glaucous* stem. The leaves and fruit have a disagreeable odor and contain *alkaloid* poisons.

HEMORRHAGE, the escape of blood from a blood vessel; in bleeding from an *artery*, bright red blood spurts in jets, keeping time with the beating of the heart; in bleeding from a *vein*, dark blood flows steadily; and in *capillary* bleeding, the blood oozes from a raw-looking wound surface. Bleeding into the tissues is termed *extravasation*; bleeding from the nose, *epistaxis*; vomiting of blood, *hoematemesis*; coughing up of the blood from the air-passage, *hoemoptysis*; the presence of blood in the urine, *hoematuria*; in the faeces, *meloena*. To arrest bleeding, pressure is applied to the bleeding point, or a tourniquet is tied round the limb between the bleeding point and the heart; the application of cold, especially for an oozing wound, hot water (130° F. and over), perchloride of iron, or suprarenal extract, are also found to be valuable remedies.

HEMORRHOIDS. See PILES or HAEMORRHOIDS.

HEMP is an annual herb, *Cannabis sativa*, natural order *Cannabineoe*. Originally an inhabitant of Persia it is now grown in all parts of Europe, because its bast fibres are used in the rope industry. The plant is *dioecious* with opposite lower leaves and deeply *partite* strongly *dentate*, rough alternate upper leaves, with two lateral *stipules*. The male *inflorescence* is a *raceme* and the female flowers occur in the axils of the leaves. Petals are absent. The fruit is one-seeded. Intoxicating preparations for drinking and smoking, *e.g.* Arab. *Hashish*, Indian *Bhang*, are made from the female flowers, resin, and leaves.

HEMPEL, FRIEDA (1885), Operatic Soprano. *B.* in Germany. educated at Sterns Conservatory, Berlin, under Mme. Nicklass Kempner. In 1905 at Royal Opera House, Berlin, made professional debut in 'Merry Wives of Windsor'. From 1905-1907 appeared in Schwerin Opera House. Toured Europe and was the principal guest soprano at Covent Garden, London, Warsaw, Brussels, San Sebastian, Grand Opera, Paris, and principal opera houses throughout Europe. decorated by King of Belgium, Emperor of Germany; one of five Imperial German Court Singers. From 1907-1912 at Royal Opera, Berlin, was principal coloratura soprano. With Metropolitan Opera Company since 1912.

HEMPSTEAD, a village of Nassau co., New York, on the southern coast of Long Island, 20 miles E. of New York City. It forms a part of the town of Hempstead, which includes the villages of East Rockaway, Freeport, Hempstead, Lawrence, Rockville Center, and a part of Floral Park. All these are residential places. The total population is about 45,000. Pop. of Hempstead itself is about 5,000.

HENBANE, a flowering beinnial plant, *Hyoscyamus niger*, natural order *Solanaceoe*. It contains in its leaves and flowers two *alkaloid* poisons, *Hyoscyamine* and *Hyoscine*, and a poisonous oil.

HENDERSON, a city of Kentucky, in Anderson co., of which it is the county seat. It is on the Louisville and Nashville, Illinois Central and other railroads, and on the Ohio River. It is the center of an extensive timber, coal and salt region. It is connected by steamship lines with Louisville, Memphis and other points on the river and from it are shipped large quantities of tobacco and grain. Its industries include tobacco factories, car works, lumber mills, and carriage and wagon factories. It has also plants for the making of flour products, wool products, and churns. Pop. 1920, 12,169.

HENDERSON, ALEXANDER (1583-1646), Scot. Presbyterian divine; prof. at St. Andrews; one of commissioners to interview Charles I., who liked him; tried to mediate between Charles and Parliament, 1642; Moderator of General Assembly; has been called 'the second founder of the Reformed Church in Scotland.'

HENDERSON, RT. HON. ARTHUR (1863), Brit. Labor leader; served apprenticeship as moulder in Newcastle; held various positions in Trade Union movement; took part in munice. affairs; mayor of Darlington, 1903; M.P. for Barnard Castle, 1903-18); secretary of Labor party, 1908-10 and 1914-17; chief whip of Labor party, 1914; and became chairman at outbreak of war; joined first Coalition government as president of Board of Education, 1915-16; paymaster-general and Labor adviser to government, 1916; joined second Coalition as member of war cabinet without portfolio; went on government mission to Russia (May, 1917), as outcome of which resigned Aug. of same

year; defeated at general election, 1918; but elected for Widnes (Sept., 1919). In the election of 1922 he was elected by the Labor party, and was one of the prominent party leaders in Parliament in 1923.

HENDERSON, JOHN (1747-85), Eng. actor; achieved great success in leading Shakespearean parts at Drury Lane and Covent Garden; rival of Garrick; buried, Westminster Abbey.

HENDIADYS (Lat. from Gk. *hen dia duoin*, one by two), term in rhetoric for connecting two equivalent nouns by 'and'; common Virgilian usage, *e.g.* '*Vinclis et carcere frenat*,' or '*Italiam Lavinaque litora*.'

HENDON (51° 36′ N., 0° 14′ W.), town, Middlesex, England; chief English flying ground. Pop. 1921, 56,014.

HENDRICK, BURTON JESSE, (1871), Writer. *B.* in New Haven, Conn. At Yale, 1895, Bachelor of Arts and 1897 Master of Arts. 1896-1898, editor of the New Haven Morning News; 1899-1905, on staff of New York Evening Post; 1905-1913 staff writer for McClure's Magazine; associate editor of World's Work since 1913. Author of *The Age of Big Business*, (in Yale Chronicles of America); *Life and Letters of Walter Hines Page, American Amabassdor to Great Britain*, 1913-1918. A book *The Victory at Sea* of which he was co-author with Admiral William S. Sims won the Pulitzer prize of $2,000.00 for the best book published on United States History in 1920. Writes for magazines.

HENDRICKS, THOMAS ANDREWS (1819-1885), former Vice-President; *b.* near Zanesville, O.; *d.* Indianapolis. He studied law and was admitted to the Indiana bar in 1843 after graduating at South Hanover College, Indiana. He became a member of the state legislature, served in the U. S. House of Representatives, 1852-3, and from 1863 was in the Senate. He was twice defeated as a Democratic candidate for governor of Indiana, but his third candidature, 1872 was successful. As running mate with Tilden on the Democratic ticket in the presidential election of 1876, he was elected Vice-President by popular vote, but the Electoral Commission (*q.v.*) awarded the election to the Republicans. In 1884 he was again nominated as Vice-President, this time on the successful Cleveland ticket, and served as such for a brief period till his death.

HENEY, FRANCIS JOSEPH (1859), lawyer; *b.* in New York. Moved to California at age of five; educated at University of California and Hastings Law School. In 1883 admitted to the bar; from 1885-1889 in cattle business in Arizona; 1886-1888 at Fort Apache, Arizona conducted an Indian Trade Store. At Tucson, Arizona, 1889-1895 practised law; was one of the lawyers in litigation over Mexican land grants in Arizona. 1893-1894 attorney general of Arizona; in 1895 removed to San Francisco and confined business to civil cases; discoverer of conspiracy to protect guilty politicians by United States Attorney John H. Hall in consideration of reappointment.

HENGELO, HENGELOO (52° 16′ N., 6° 47′ E.), town, Holland. Pop. 1921, 26,002.

HENGIST and HORSA, two bro. Jutes, the first of the Teutonic invaders, called in to aid the Brit. king, Vortigern *c.* 450, against the Picts. Horsa was subsequently killed in battle, but Hengist made himself king of Kent, 458.

HENSTENBERG, ERNST WILHELM (1802-69), Lutheran ecclesiastic; studied at Bonn, specially devoting himself to Old Testament and Oriental languages; prof. at Berlin, 1826; vigorously defended conservative positions in Biblical criticism.

HENLEY, JOHN (1692-1758), Anglican clergyman, from 1729, at Lincoln's Inn Fields; called 'Orator Henley'; attracted attention by absurd innovations as preacher.

HENLEY, WILLIAM ERNEST (1849-1903), Eng. poet; *b.* Gloucester; edit. successively *The Magazine of Art*, *National Observer*, and *New Review*; collaborated with R. L. Stevenson in several plays; part author of a Slang dictionary and a *Life* and edition of Burns; a trenchant and fearless critic; wrote some exquisite lyrics.

HENLEY-ON-THAMES, mrkt. tn. and munic. bor., Oxfordshire, Eng. (51° 32′ N., 0° 54′ W.); favorite summer resort, noted for its beautiful surroundings; is famous among amateur oarsmen for annual regatta, begun in 1839. Pop. 6,400.

HENNA, the powdered leaves of *Lawsonia inermis*. These contain a red stain used, in Persia and India, to dye the finger nails, etc.

HENNEPIN CANAL. See CANAL.

HENNEPIN, LOUIS (1640-1710), a French missionary and explorer. He was born in Belgium. In 1873 he visited Canada and five years later joined La Salle on his famous expedition down the Mississippi. He explored the Illinois to its mouth and the upper Mississippi. In

1680 he was captured by Sioux Indians and was adopted into their tribe. During his captivity he visited the Falls of St. Anthony and having escaped returned to Fort Frontenac in 1681. He returned to France in 1683 and published his famous book *Description of Louisiana*. The second book, *New Discoveries in Three Great Countries*, published in 1697, claimed to have shown that he descended the Mississ ppi to its mouth. This claim has never been proved false. The third book, *A New Voyage*, was published in 1698.

HENNEQUIN, PHILIPPE] AUGUSTE (1763-1833), Fr. hist. painter and engraver patronised by Napoleon. His grandson, Alfred Néocles 1842-87, was a prominent comic playwright.

HENRI, ROBERT (1865), artist; *b.* in Cincinnati; educated in Schools in New York and elsewhere; student in Julien Academy, Ecole des Beaux Arts, Paris and Pennsylvania Academy of Fine Arts; studied in Spain and other countries without instruction. His picture 'La Neige' purchased in 1899 by the French Government for the Luxembourg Gallery, represented in collections of Art Institute, Chicago, New Orleans Art Association, Dallas Art Association and many others. Awarded gold medal at Philadelphia Art Club in 1909. Portrait prize at Wilmington Society of Fine Arts in 1920. Member of National Institute Arts and Letters and others.

HENRIETTA MARIA (1690-66), consort of Charles I. of Great Britain; *d.* of Henry IV. of France; raised money for king during Civil War; encouraged impeachment of five members; fled to France, 1644; twice visited England after Restoration.

HENRY I., BEAUCLERC (1068-1135), king of England; youngest *s.* of William the Conqueror; succ., 1100. Elder bro., Robert, claimed crown, but was defeated and imprisoned, his duchy of Normandy being added to H.'s dominions. Various conspiracies formed in Normandy in favour of Robert's *s.*, William, were supported by Fr. king, whom H. defeated at *Bremule*, 1119. H.'s *s.* William was drowned in *White Ship*, 1120. Exchequer was instituted in this reign.

HENRY II. (1133-89), king of England; *s.* of Matilda and Geoffrey Plantagenet; grandson of Henty I.; succ. 1154; revoked Stephen's grants of crown lands, and revived King's Court and Exchequer; at first supported by his minister, Becket, whom he cr. abp.; quarrelled with Church, issued Constitutions of Clarendon, 1164, which Becket opposed; after latter's murder, 1170, H. had to make various concessions to Church conquered Ireland, 1172; crushed barons rebellion, 1173, and reduced their powe by legal reforms; sons intrigued agains H. towards end of reign.

HENRY III. (1207-72), king o England; succ. his *f.*, King John, 1216 during minority French were expelle from England; assumed government 1227; unsuccessfully invaded Poitou 1230; defeated at *Taillebourg*, 1242 aimed at arbitrary power; left many important offices vacant; aroused hostility of barons, who compelled him t assent to Provisions of Oxford, 1258 subsequent annulment of which resulte in outbreak of Barons' War; H. defeate at *Lewes*, 1264; henceforth a cipher.

HENRY IV. (1367-1413), king o England; *s.* of John of Gaunt; fought i East, 1392-96; helped to suppres Gloucester's rebellion, 1397; banished 1398. On Richard II.'s seizing hi estates, H. invaded England, defeate Richard, and became king, 1399; de feated Scots, 1402; defeated Percies who had joined Glendower's revolt, a *Shrewsbury*, 1403; crushed Scrope's re bellion, 1405; subdued Percies, 1408, an ended Welsh rebellion; opposed Lollards

HENRY V. (1387-1422), king of Eng land; *s.* of Henry IV.; succ. 1413; re pressed Lollards; invaded France an won battle of *Agincourt*, 1415; success fully besieged Rouen, 1417-19; forme alliance with Philip of Burgundy, 1419 m. Princess Catherine of France; at tained regency of France and successio to Fr. crown by Treaty of Troyes, 1420 spent remaining years in suppressing F risings against Eng. rule; took Meaux 1422.

HENRY VI. (1421-71), king of Eng land; *s.* of Henry V.; succ., 1422; minc till 1442; Cade's rebellion suppressed 1450; Fr. possessions lost, 1453; insan in 1453, subsequently recovered. War of Roses began, 1455; ended in 1461 wit H.'s defeat, when Edward IV. becam king. H. was murdered in Tower, 147 He founded Eton School, and King Coll., Cambridge.

HENRY VII. (1457-1509), king England; founder of Tudor line; hal bro. of Henry VI.; m. Edward IV. *d.* Elizabeth; defeated Richard III. *Bosworth Field* 1485; and became kin instituted Court of Star Chamber, 148 suppressed Lambert Simnel's rebellio by victory at *Stoke*, 1487; supporte Brittany against France; formed allian with Span. and Ger. Kings, and i vaded France, 1492; concluded comme cial treaty with Flanders, 1496; ove threw Perkin Warbeck's insurrectio

defeating his supporters at Blackheath, 1497; amassed large fortune; strengthened crown at expense of nobles.

HENRY VIII. (1492-1547), king of England and Ireland; second *s.* of Henry VII.; succ. of 1509, and m. Catharine of Aragon, his *b.*'s widow; invaded France, winning *Battle of Spurs*, 1514; held conclave with Francis I. at Field of Cloth of Gold, 1520, but sided with Francis's rival, Charles V.; made peace with France in 1527. Having no male heir, H. desired divorce; Wolsey's failure to obtain the necessary papal decree led to his downfall. H. disavowed papal supremacy in England, and, with Cromwell's aid, broke with Rome and established himself as head of Eng. Church; divorced Catharine, 1533, and m. Anne Boleyn, who was beheaded in 1536; dissolved monasteries, 1536, and put down Pilgrimage of Grace, 1537. After Anne Boleyn's execution, H. m. Jane Seymour, their *s.* afterwards reigning as Edward VI.; subsequent wives were Anne of Cleves, Catharine Howard and Catharine Parr. Later years marked by wars with France and Scotland; led expedition to France; took Boulogne, 1544.

HENRY I., THE FOWLER (*c.* 876-936), Holy Rom. emperor; duke of Saxony, 912; elected king of Romans, 919; acquired Lorraine, 923; defeated Slavs, Danes, Hungarians.

HENRY II., THE SAINT (973-1024), Holy Rom. emperor; succ. Otto III., 1002; king of Italy, 1004; crowned emperor at Rome, 1014; waged intermittent war with Poland, 1002-18; liberated Bohemia from Polish yoke, 1004; concluded peace at Bautzen, 1018; supported Benedict VIII. against Greeks, 1021.

HENRY III., THE BLACK (1107-56), Holy. Rom. emperor; *s.* of Conrad II.; Ger. king, 1028; emperor, 1029; waged was with Bretislaus of Bohemia, whom he finally forced to acknowledge his suzerainty, 1041; defeated Hungarians, 1045, and reinstated Peter of Hungary; emperor by Clement II., whose election to papal chair be had obtained; put down rebellion in Lorraine, 1050; built Worms, Mainz, and Spires cathedrals.

HENRY IV. (1050-1106), Holy Rom. emperor; *s.* of Henry III. elected Ger. king, 1053; emperor, 1056; engaged in struggles with Swabia and Carinthia; deposed and defeated Otto of Bavaria, 1071; waged war against Saxony and Thuringia, 1073-88; came into conflict with Pope Gregory VII. (*q.v.*), who excommunicated him in 1076, and forced him to do penance at Canossa, 1077. H. subsequently repudiated his vow of obedience, deposed pope, and elected antipope, Clement III.; invaded Italy, 1081; took Rome, 1083; was crowned emperor, 1084. Ger. princes elected another king, but H. gradually overcame all opponents. Later years marked by further disputes with popes and Ger. princes; abdicated, 1105.

HENRY V. (1081-1125), Holy Rom. emperor; *s.* of Henry IV.; elected Ger. king, 1098; emperor, 1106; subdued Robert of Flanders, 1106; reign marked by dispute with pope concerning investitures. H. took Paschal II. prisoner, 1111; was excommunicated, 1112; ban removed and dispute settled by Concordat of Worms, 1122; waged intermittent war with Lothair of Saxony; later years marked by war in Holland and invasion of France.

HENRY VI. (1165-97), Holy Rom. emperor; *s.* of Frederick I.; elected Ger. king, 1169; m. Constance, heiress to throne of Sicily, 1186; crowned king of Italy, 1186; emperor, 1191; succession to Sicily opposed by Tancred, after whose death H. became king; coalition formed against him in Germany, 1191, but he put down all opponents both there and in Italy.

HENRY VII. (*c.* 1269-1313), Holy Rom. emperor; *s.* of Henry III., Count of Luxembourg; elected Ger. king, 1308; emperor, 1309; tried to unite Germany and Italy, and was crowned at Milan, 1311; revolts occurred, in dealing with which he met with little success; *d.* while marching to Naples.

HENRY I. (1008-60), king of France; waged war with Odo, Count of Blois, and William, Duke of Normandy.

HENRY II. (1519-59), king of France; persecuted Protestants; recovered Boulogne from England, 1550; took Metz, Toul, Verdun, from Emperor Charles V.; recovered Calais, 1558.

HENRY III. (1551-89), kingof France; reign marked by war between Catholics and Huguenots; participated in massacre of St. Bartholomew, 1572; very dissolute; assassinated.

HENRY IV., HENRY OF NAVARRE (1553-1610), king of France; king of Navarre, 1562; leader of Huguenots; m. Margaret of Valois, *s.* of Charles IX., 1572; succ. to Fr. throne, 1589; had to fight Spain and the League; became Catholic, 1593; peace with Spain, 1598; passed Edict of Nantes in favour of Huguenots, 1598; developed agriculture and commerce; introduced silk industry; carried out financial reforms; directed influence against Hapsburgs; assassinated by Ravaillac. See FRANCE: *History.*

HENRY I. (*c.* 1210-74), king of Navarre; *s.* of Theobald I.; m. Blanche of Artois; his *d.* Johanna m. Philip IV., by which marriage the crowns of Navarre and France were united.

HENRY II. (1503-55), titular king of Navarre; *s.* of Jean d'Albret; his claim to the crown, in right of his wife Catherine of Navarre, was successfully disputed by Ferdinand I. of Spain. He m. Margaret, Duchess of Alencon, and had issue, Jeanne d'Albret, *m.* of Henry IV. of France.

HENRY OF PRUSSIA, PRINCE (1862), *b.* of ex-Kaiser William II.; *b.* at Potsdam; followed an army career; was sent to China, 1900, to 'avenge' Boxer outrages; on diplomatic mission to U. S., 1902; subsequently nominally inspector-general and grand-admiral of Ger. navy.

HENRY VII. (1221-42), Ger. king elected, 1220; led rebellion against *f.* Emperor Frederick II., 1233, but submitted, 1235; imprisoned.

HENRY RASPE (*c.* 1202-47), Ger. king; aided Emperor Frederick II.; Landgrave of Thuringia, 1242; Ger. king, 1246; defeated Conrad.

HENRY II. (1489-1568), duke of Brunswick-Wolfenbüttel; opposed Reformation; defeated by League of Schmalkalden, 1542; defeated Albert of Bayreuth, 1553.

HENRY I. (1512-80), king of Portugal; succ., 1578, and proved a feeble administrator. He had previously held the archbishoprics of Braga, Lisbon, and Coimbra; was cr. cardinal, 1542.

HENRY, four kings of Castile.—Henry I., reigned 1214-17.—Henry II. 1333-79, became king, 1369, after killing bro., Peter the Cruel; supported France against England.—Henry III., 1379-1406, succ., 1390; called Cortes to Madrid, 1394.—Henry IV., 1425-74, succ., 1453; deposed, 1468.

HENRY (*c.* 1174-1216), emperor of Constantinople; *s.* of Baldwin, Count of Flanders; shared in Fourth Crusade; noted for bravery, toleration, and wise administration.

HENRY STEWART (1725-1807), Cardinal York, was younger *s.* of James, the Old Pretender, *b.* of Charles Edward, the Young Pretender; cr. cardinal, 1747; called himself 'Henry IX.' on death of his *b.*, 1788.

HENRY THE LION (1129-95), duke of Saxony and Bavaria; defeated Abotrites, and extended his dominions; established claim to Bavaria. 1156; acquired Lübeck, 1158; aided Frederick I. of Poland and Italy; waged against Denmark, which ended, 1 went as pilgrim to Jerusalem, 1 banned by emperor, 1180; submit 1181; obtained Brunswick and Lüneb banished, 1189; subsequently rebe against Henry VI.

HENRY THE PROUD (*c.* 1108- duke of Saxony and Bavaria; put d revolt in Bavaria; supported Lot against Hohenstaufens.

HENRY, PRINCE OF BATT BERG (1858-96), *s.* of Prince Alexa of Hesse and Countess von Hauke Princess Beatrice of England, 1 engaged in Ashanti War; *d.* off Si Leone.

HENRY FITZ HENRY (1150- Eng. prince; 2nd *s.* of Henry II., subsequently heir to the throne; frequently at variance with his *f.*; fa for knightly accomplishments; *d.* fever.

HENRY OF BLOIS (1101-71), bp Winchester, 1129; nephew of Henr and *b.* of King Stephen; papal leg 1139-44; ardent ultramontanist; qua ling with Stephen, proclaimed t cousin Matilda queen, 1141; reverte Stephen's side; but never regained favor.

HENRY OF HUNTINGDON (*c.* 1 1155), Eng. chronicler; was archdea of Huntingdon; his *Historia Anglo* extended to 1154, and was first p 1596.

HENRY OF GERMANY (1235-71 of Richard, Earl of Cornwall, *b.* Henry III.; murdered as a Royalist Simon de Montfort's sons.

HENRY OF PORTUGAL, THE NA IGATOR (1394-1460), Portug. prince of John I. and Philippa, John of Gau *d.*; served with great distinction at s of Ceuta, 1415; subsequently took g interest in navigation and discovery, for years sent expeditions along W. c of Africa at his own expense; among discoveries were the Madeira Islands Azores, where he established colon constructed observatory at Sagres, Cape St. Vincent; in later years be a distinguished himself in the field Morocco, and took Alcazar the Littl 1458; encouraged education.

HENRY OF TOULOUSE, OR BRUYS (fl. early XII. cent.), Fr. ev gelist who influenced development of Albigensian movement (*q.v.*); preac moral reformation rather than tenets, but attacked the Church caused the personal intervention of Benedict, who crushed the moveme

HENRY, JOSEPH (1797-1878), an American scientist, *b.* in Albany, New York. Educated at Albany Academy, he afterwards contemplated adopting the medical profession, but in 1835 he was unexpectedly appointed assistant engineer on the survey of a route for a state road from the Hudson R. to Lake Erie and he at once embarked with zeal upon the new enterprise. He appears to have been the first to adopt insulated wire for the magnetic coil. He was the first to magnetise iron at a distance, and he was also the first to apply the telegraph to meteriological research. From 1868 he was chosen annually as president of the National Academy of Sciences, and he was also president of the Philosophical Society of Washington from the date of its organization in 1871.

HENRY, MATTHEW (1662-1714), Welsh Presbyterian preacher; held charges at Chester and Hackney; famed as author of *Exposition of the Old and New Testaments*, a work of sincerity and charm, left unfinished at his death.

HENRY, O. See under PORTER, SYDNEY.

HENRY, PATRICK (1736-1799), Revolutionary leader and orator; *b.* Hanover co., Virginia; *d.* Charlotte co. He was of Scotch and Welsh descent, had little school education, married in penury at eighteen, failed in store-keeping and farming, and finally studied law, like his father, who was judge of the Hanover court. He was admitted to the bar of his native county in 1760, and became immediately successful, due to the revelation his practice made of his powers of oratory. His eloquence was effectively used in 1763 when he exploded with indignation in court in a speech challenging the right of George III. to annul the acts of the colonial legislatures. As a raw rustic he became in 1765 a member of the Virginia House of Burgesses, where he presented resolutions directed against the Stamp Act (*q.v.*) and affirming that the colonial assembly should have the sole and exclusive right to levy taxes. Thereafter he projected as a leader of the revolutionary cause against the exactions of the then misguided colonial policy of Great Britain. At the first colonial Congress that met in Philadelphia in 1774 he sounded the first note of the new nationalism then in the throes of birth, urging that there should be no more designations of New Englanders, New Yorkers, Pennsylvanians or Virginians, but that all were Americans. 'I am not a Virginian', he said, 'but an American'. The next year, before the second Revolutionary Congress, he made the speech in which he originated the famous declaration 'Give me liberty; or give me death', while advocating the arming for immediate war against Great Britain of the Virginia militia, which he later commanded. He became Virginia's first governor in 1776 and framed its first constitution, serving till 1779. He sat in the legislature from 1780 to 1784, and was again governor for the two years following. He was a bitter opponent of the Federal Constitution and vainly exercised his passionate oratory against its ratification. He charged that the power conferred upon the federal authority curtailed State rights, and succeeded in having amendments incorporated that represented a bill of rights for the States. His death cut short a renewed term of service in the Virginia legislature, to which he was re-elected in 1799.

HENSCHEL, SIR GEORGE (1850), baritone singer, composer, and conductor; naturalized Englishman, 1890; sang with great success at Brussels, 1873; Cologne, 1874, and London, 1877; settled in London, 1885, and succeeded Jenny Lind at the Royal Coll. of Music, 1886-8; his compositions include songs, vocal studies, an opera, a comic opera, a *Requiem Mass*, *Stabat Mater*, and *Te Deum*.

HENSLOW, JOHN STEVENS (1796-1861), Eng. scientist; prof. of Mineralogy, and later of Bot., at Cambridge. His discoveries established the *phosphate industry* in England.

HENSLOWE, PHILIP (*d.* 1616), Eng. theatre owner; built the 'Rose' and 'Fortune' theatres, and held shares in others, where many famous Elizabethan plays were performed. His *Diary* (MS. in Dulwich Coll.) contains valuable information relative to his period.

HENTY, GEORGE ALFRED (1832-1902), Eng. war correspondent and boys' author; served in purveyor's department in Crimea; acted as newspaper correspondent in Franco-Prussian and Turco-Servian Wars and other campaigns; wrote about eighty popular historical and military stories for boys.

HEPHÆSTION (*d.* 324 B.C.), Macedonian soldier who m. Drypetis, *s.* of wife of Alexander the Great, whose inseparable friend he was.

HEPHÆSTION (II. cent. A.D.), Gk. grammarian; wrote a valuable work on Gk. prosody; Eng. trans. by Barham, 1843.

HEPHÆSTUS (classical myth.), the god of fire and metal-working (Roman Vulcan); *s.* of Zeus and Hera; lame from

birth; was flung from Olympus by his *f.*, whose anger he had incurred. He forged the thunderbolts of Zeus, made the armor of Achilles, the crown of Ariadne, etc. The chief seat of his worship was the isle of Lemnos.

HEPPLEWHITE, GEORGE, noted Eng. cabinet-maker, who fl. during latter portion of XVIII. cent.; contemporary of Chippendale, but his work was of a lighter and more elegant character. Painted designs upon satinwood were a feature of many of his productions.

HEPTARCHY, condition or government by seven persons; generally applied to the 'Saxon H.' in Britain, dating from about the VI. cent., when the country was divided into seven kingdoms: Kent, Sussex, Wessex, Essex, Northumbria, East Anglia, and Mercia.

HEPTATEUCH, first 7 books of Old Testament.

HERA (classical myth.), known by the Romans as Juno, *d.* of Cronus and Rhea; wife of Zeus; *m.* of Hephaestus, Ares (Mars), Hebe, and Eileithyia. As queen of heaven she participated in the supreme honors paid to Zeus; famed as the embodiment of wifely chastity; celebrated for her surpassing beauty, of which she was extremely vain. She was devoted to the Greeks and their country, and was principally worshipped at Argos and Samos.

HERACLEA, several ancient Gk. towns.—H. Lucania, where Pyrrhus defeated Romans, 280 B.C.; H. Minoa, Sicily, naval post of Carthaginians. H. Pontica, Bithynia, destroyed by Romans, I. cent. B.C.

HERACLEONAS, Byzantine emperor for a short space in 641 A.D.

HERACLIDÆ, children of Heracles, who sought asylum in Athens from Eurystheus, king of Mycenae. After several unsuccessful attempts they conquered the Peloponnesus and founded the kingdoms of Sparta, Messenia, and Argos.

HERACLIDES OF PONTUS (IV. cent. B.C.), Gk. philosopher.

HERACLITUS (*c.* 53-475 B.C.), Gk. philosopher; of aristocratic birth; called the *Weeping Philosopher*; did much for study of metaphysics; thought 'everything is and is not,' and that in diversity true unity was to be found; fire is the original principle, and out of it the soul was created.

HERACLIUS (*c.* 575-642), Byzantine emperor; beset by Avars from Danube, and by Persians in East; made Treaty with Avars, 620; defeated Persian 627-28; lost Syria and Egypt to Arabs.

HERALD, originally an officer whos duty it was to convey messages fro commander of force to his opponen function afterwards included makin military proclamations of all kinds, an later, superintendent public ceremoni and processions. About XIV. cen colleges of h's were founded in mo European countries to record armori bearings of nobility and gentry.

HERALDY, science of blazoning coa of arms. *Armorial bearings*, or devic blazoned on shields, were unknown i England at time of Norman Conques by 13th cent. they were in general us throughout Europe, and a regular scienc of heraldry had been developed; prob ably largely influenced by the Crusade as in warfare, where closed helmet rendered recognition impossible. som bold representation on the shield, a mark of identity, became necessary t the leaders. These being of the uppe class, armorial bearings came to be th prerogative of that class, and were, an still remain, the outward sign of nobi or gentle rank, the granting or creatio of which rests with the sovereign.

In mediaeval times the undifference arms belonged to a single holder, fro whom it descended to his heirs, whil cadet branches had toshow their cadenc by various marks of difference. Mark of difference are still in use, althoug not compulsory in England; the *label*, file of three points placed across top shield, is now properly used only by th eldest son, while the signs of younge sons are the crescent, mullet, martle amulet, etc. These marks are quit small, and are generally placed in centr near top of shield, *Marshalling arms* the disposition of several coats arms of the same shield, to show descen marriage, alliance, etc. In moder times, when a man marries an heiress th two coats of arms are generally ma shalled by the wife's arms being shown o a small escutcheon superimposed on th husband's coat and their children bea the two coats quarterly—the father arms in the first and fourth quarters, th mother's in the second and third. Whe the wife is not an heiress the arms ar marshalled by impalement—*i. e.*, th shield is parted and the husband's arm are shown on right side, while the wife are shown on left.

Technical name for whole device *achievement*, which consists of arm (shield and device), helmet, mantling wreath, crest, and motto. Other ac juncts are supporters, compartmen *cri-deguerre*, standard, badge, augmen tation, all of which may be possessed b

commoners. Knights of any order may have circle and badge of order, and peers may add coronet of rank. *Shield* consists of colored background called the field, and device thereon known as charge; it varies in shape. *Helmet,* placed above shield, may vary in shape, style, and design, but certain rules regulate its position and form. *Mantling* is cloth hanging from point on top of helmet; originally plain cloth to protect armour from weather. *Wreath* is used to attach crest to helmet; originally a fillet of silk twisted round it. *Crests* only came into general use in England in 16th cent., and are now most important adjunct of armorial bearings. *Mottoes* are a late development, and only appeared when standard was represented as a drawing and no longer carried in battle; they became usual in late 17th cent. *Supporters* are granted to Knights of the Garter, Thistle, St. Patrick, and to Knights Grand Cross and Grand Commander of any order who petition and pay for them, and to peers. They are sometimes granted as mark of royal favor. The *compartment* is for the supporters to stand upon; generally a golden scroll. *Cri-deguerre* is very exceptional; it was a family battle-cry, and could be inserted on standard. *Badges,* simple devices used for purpose of speedy recognition, date from even earlier times than armorial bearings. *Standards* originally represented arms, like the shield, but were later charged with badge as more easily recognizable. *Augmentations* are additions to existing arms granted by sovereign for services rendered; they may be supporters, additional crest, innerscocheon, etc. Peers' coronets, another accessory to shield, are gilt metal circlets varying in pattern according to rank.

Turning to details of shield, the *field* is the tincture of the back-ground, which may be a color, metal, or fur. Colors are *gules, azure, sable, vert, purpure* (red, blue, black, green purple); metals, *or* and *argent* (gold, silver); principal furs, *ermine* (white, with black spots), *ermines* (black with argent spots), *erminois* (gold, with black spots), *vair,* and *potent* (silver and blue in alternate divisions) The field may be of one or more tinctures, variously disposed. Partition lines are generally plain, but there are twelve varieties of such lines, named *engrailed, invected, embattled, indented, dancetty, wavy, nebuly, raguly, potente, dovetailed, flory,* and *rayonne.*

The ordinary charges, called *ordinaries,* are nine in number. The *pale, fesse,* and *bend* are bands which respectively cross shield perpendicularly, horizontally, and diagonally. Cross is a common bearing from very early times and occurs in various forms, as *cross flory, cross patee, cross botonny,* etc. *Saltire* is a diagonally set cross, in form of St. Andrew's cross. *Chevron,* an early charge, resembles a gable. *Pile* is wedge-shaped device from chief to foot of shield. *Chief* is band at top of shield. *Quarter* is dexter top quarter of shield. Pale, bend, saltire, and chevron all have diminutives, respectively *pallet, bendlet, gyron, chevronel.* Diminutive of quarter, is *canton*; of canton, *chequer. Fesse* duplicated becomes a *bar*; diminutive, *barrulet.* Other ordinary charges are the *lozenge,* diamond-shaped figure; *flaunches,* sides of shield cut off by curved lines; *innerscocheon,* small superimposed shield; *tressure,* inner border of shield decorated by fleur-de-lys *mascle,* voided lozenge; *fret,* voided lozenge and saltire interlaced.

Principal animal used as heraldic charge is lion, whose position may be *rampant, passant, statant, sejant, sejant-erect, couchant, dormant,* or *salient.* A lion full-faced is *gardant*; head looking backwards, *regardant.* These terms are supposed to apply with few exceptions to all heraldic animals. Mythical animals represented are dragon (four-legged), wyvern (two-legged), griffin, unicorn, pegasus, and other winged animals. Other animals are given sea characteristics, series including mermaids, sea-wolves, sea-lions, etc. Eagle is most important bird represented in armoury; it is generally found *displayed* (with spread wings), and often double-headed. Other positions of birds are *close, volant,* and *rising.* Pelican resembles eagle. Peacock with spread tail is called 'peacock in his pride.' Fish are less frequent; positions are *hauriant* (erect) and *naiant* (swimming). Flowers and trees often occur; fleur-de-lys is generally considered a conventional iris; rose is represented without stalk or leaves, unless mentioned; trefoil, quatrefoil, and cinquefoil are conventional forms of leaves.

HERAT (34° 26′ N., 62° 8′ E.), city, in Afghanistan, situated on Hari-Rud, 2,500 ft. above sea-level; owing to central position, of great hist. and political interest, and formerly of commercial importance. Once a large city with magnificent buildings, now a mass of ruins; strongly fortified by ditch, walls with 5 gates, and a citadel on N. side; built in form of quadrangle, with 4 principal streets (called Chahar-Suk) meeting in centre; other streets filthy and almost desolate. Great Mosque, or Mesjid-i-Juma, remains of mosque of Mosaalla tomb of Abdullah Ansari, ruined palaces of Bagh-i-Shah and Takhd-i-Sefer, marble mausoleums, and other ruins testify to former splendor.

H. was scene of struggles throughout history of Central Asia; date of foundation unknown; flourished under princes of house of Timur, when finest buildings were erected. Pop. including Persians, Tajiks, and Chahar-Aimaks, 20,000.

HERAULT (43° 30′ N., 3° 20′ E.), S. department, France; area; 2,402 sq. miles; surface rises from S. coastal plain to Cévennes in N.W.; drained by Hérault, Orb.; wine, fruits, coal; chief town, Montpellier. Pop. 1921, 488,215.

HERBARIUM, OR HORTUS SICCUS, a classified collection of plants which have been dried and preserved so that their characteristic features are illustrated as far as possible.

HERBART, JOHANN FREIDRICH (1776-1841), Ger. philosopher; studied at Göttingen, 1805; prof. at Königsberg, 1809; prof. of Philosphy, Göttingen, 1833-41. The importance of H.'s work is largely in psychology, and he arrived at his results by a combination of metaphysics, mathematics, and experience.

HERBERT, GEORGE (1593-1633), Eng. ecclesiastic and poet; after vainly seeking perferment at court, took orders, and was made rector of Bemerton, Wilts 1630. In *The Temple*; *Sacred Poems and Private Ejaculations*, pub. the year after his death, are some of the finest religious poems in the language.

HERBERT, HENRY WILLIAM (1807-58), Eng. novelist and sporting writer; wrote, under the name of 'Frank Forester, '*Field Sports of the United States*, *Young Sportsman's Complete Manual*; also historical works, including *The Chevaliers of France*, *The Captains of the Old World*, etc.

HERBERT, VICTOR (1895), conductor; *b.* in Ireland. At age of seven began musical education studying under leading masters in Germany. Principal violoncello player in Court Orchestra at Stuttgart; heard in concerts in Europe. In 1886 came to New York as solo violoncellist of Metropolitan Opera Company. Has been connected with orchestral organizations as soloist and conductor including Siedl's and Thomas'. Since 1894, bandmaster of 22nd Regiment Band, New York. Since 1904 conductor of Victor Herbert's New York Orchestra. Composer of 'Prince Ananias', 'The Wizard of the Nile', 'The Fortune Teller', 'The Idols Eye' and compositions for orchestras.

HERBERT OF CHERBURY, EDWARD, BARON (1583-1648), Eng. soldier, diplomat, and writer; *b.* at Eyton-on-Severn; fought in Netherlands, 1610, 1614; ambassador to France 1619-21, 1622-24, having been imprisoned by Parliament in 1642, he took no part in Civil War. Author of *De Veritate*,an important metaphysical work, *De Religione Gentilium*, a comparative history of religion and other philosophical treatises. Hist. works are *Life and Raigne of Hehry VIII.* and *Expeditio Buckinghami ducis.*

HERBS, plants with no woody tissue in stems.

HERCULANEUM, ruined city of Italy, situated at eastern base of Mt Vesuvius. In 79 A.D. it was annihilated by eruption, when a stream of lava and shower of ashes covered it so completely that it was lost sight of for cent.'s; since early XVIII. cent., however, excavations have been more or less constantly going on, and now a good part of the city is open to view, including the theatre and two small temples; the discoveries render possible the reconstruction of domestic life of the ancients and many beautiful wall-paintings and statues have been brought to light, as well as philosophical MSS., coins, mosaics, etc. City was traditionally connected with Hercules; taken by Romans in Samnite Wars, and again in Social War, 88 B.C.; an important town at time of its destruction.

HERCULES, HERACLES (classical myth.), *s.* of Zeus and Alcmene, wife of Amphitryon, king of Thebes. As he grew to manhood he became celebrated for his great stature, strength, and beauty. He performed many feats of valor. Subsequently he was driven mad by the enmity of Hera, and killed his own children. At a later date Eurystheus, king of Mycene, imposed upon him the punishment of twelve great labors: to slay the Nemean lion; to destroy the Hydra; to capture the Arcadian stag; also the Erymantian boar; to cleanse the Augean stables; to slay the Stymphalian birds; to capture the Cretan bull; to capture the wild mares of Diomedes; to secure the girdle of Hippolyte, the Amazon; to capture the oxen of the giant, Geryon;to obtain the golden apples of the Hesperides; and to bring up Cerberus from the lower world.

HERCULES, PILLARS OF (*Herculis Columnae*, the name given to the twin rocks which guard the entrance to the Mediterranean atthe E. extremity of the Straits of Gibraltar. According to Pliny and Strabo, Hercules tore asunder the rocks which had before entirely divided the Mediterranean Sea from the ocean. Another legend asserts that he forced the two rocks into temporary union to

make a bridge for the safe conveyance of the herds of Geryon to Libya, and another that he narrowed the Strait so as to shut out the sea-monsters which had previously made their way in from the ocean and infested the Mediterranean.

HERD, a company of animals, usually cattle, assembled or driven together.

HERDER, JOHANN GOTTFRIED VON (1744-1803), Ger. author; *b.* Mohrungen (East Prussia); studied med. and theology at Königsberg, 1762-64; greatly influenced by Kant and Hamann; teacher at Riga, 1764-69, where he wrote *Fragmente uber die neue Deutsche Litteratur* and *Kritische Walder* (prose works); visited France, 1769; intimate friends with Goethe at Strassburg, 1770; court preacher at Bückeburg, 1771-75; to this period belong *Uber den Ursprung der Sprachen*, 1772; *Von Deutscher Art und Kunst*, 1773; *Auch eine Philosophie der Geschichte zur Bildung der Menschheit*, 1774, prose works; app. court preacher at Weimar, 1776; *Volkslieder*, (1778-79, songs and ballads), *Vom Geist der Hebraischen Poesie*, 1782; *Ideen zur Philosophie der Geschichte der Menschheit* (pub. 1785-94), prose works, and his famous translations of the *Span. Romances of the Cid* rank as his best works.

HERÉDIA, JOSÉ MARIA DE (1842-1905), Fr. poet, chief of the 'Parnassiens'; pub. *Les Trophees*, 1893; a series of sonnets, a poetical history of humanity, the work of thirty years, perfect of their kind.

HEREDIA Y CAMPUZANO, JOSÉ MARIA (1803-39), of Cuba, one of greatest Span. poets of the cent.

HEREDITAMENT, legal term for hereditable possession; 'tenements and h's' is constant phrase of land conveyance.

HEREDITY is a term which expresses in a word the most obvious relationship in ancestry—that children resemble in general and even in particular their parents and forbears; that like begets like. The recognition of heredity is an old story, but Darwin gave new life to the critical study of its significance, and as a result of innumerable researches the obscurity in which genetic relationship was shrouded has been partly dispelled.

The means of ancestral resemblance lies in the continuity of the germ plasm, in the fact that there are set aside definite cells which are handed down from generation to generation, and that from this continuous line of sexual cells each succeeding generation arises. Heredity is thus the total inheritance with which a new generation starts, before outside influences, 'nurture,' have played upon it. The inheritance obviously depends on both parents, but it may be expressed in various ways in the offspring. When parents derived from a long line of the same pure bred stock are paired, the characters of the pure breed are as a rule obvious to the minutest detail in the progeny, as any breeder can testify; but the mating of non-selected parents gives different results. Thus the offspring may exclusively resemble in one or all of its characters only one of its parents (exclusive inheritance), or it may be a compound of its progenitors' characters —a piebald foal, let us say, resulting from diversely self-colored parents (particulate inheritance). Again, a blending of features may take place, as when a tall pea is fertilized by pollen from a dwarf pea, and a pea of intermediate height results (blended inheritance); or the children may not resemble their parents at all, but may 'throw back' to some more distant ancestor, as when the indiscriminate interbreeding of domesticated rabbits of different colors finally results in the production of greys like the ancestral wild rabbit (reversion). Lastly, the offspring may break away from its ancestral line, and produce a new feature of its own, such an occurrence being known as a sport, freak, or discontinuous variation.

HEREFORD (52° 3′ N., 2° 43′ W.), city, municipal and parliamentary borough, Herefordshire, England, pleasantly situated on Wye; contains beautiful cathedral, with various styles of architecture from Norman to Perpendicular; chief features are central tower, north porch, bp.'s cloisters, and tower called Lady Arbour; trades chiefly in agricultural produce. Pop. 1921, 23,324.

HEREFORD (54° 7′ N., 8° 40′ E.), town, Westphalia, Prussia; formerly site of Benedictine abbey. Pop. 35,000.

HEREFORDSHIRE (52° 10′ N., 2° 45′ W.), county, England, on Welsh border; bounded N. by Shropshire, E. by Worcestershire, S. by Monmouth and Gloucestershire, W. by Radnor and Brecknock; area, 833 sq. miles; chief towns are Hereford (capital), Leominster, Ross, and Ledbury; rich, fertile county, well watered by Wye, celebrated for its beauty, and its tributaries, Lugg, Arrow, Frome, and Monnow; hills separate various valleys; in E. are Malvern Hills and in S.W. Black Mts. Soil produces fine wheat, barley, and hops; orchards occupy large area; celebrated cattle, sheep, and horses reared. Pop. 1921, 113,118.

HERERO OVAHERERO, Bantu race

inhabiting Damaraland, South-West Africa.

HERESY (Gk. 'choice'), used classically of a sect. In New Testament used of Pharisees and Sadducees, and by St. Paul of parties within the Church. Gradually h. came to mean theological difference, and has generally denoted any departure from the recognized belief of the Church. It is often said that the growth of h. within the Church forced her to define dogmas, that is the contradiction of opposition to that which had always been accepted, but never defined. The first five cent's of Christianity saw a series of religious doctrines and movements developed, which were rejected by the Church as a whole, of which Gnosticism and Arianism were the chief. The Fathers denounce h. in unmeasured terms, few even admitting the honesty of the heretics. The Early Church had defended the rights of each man to choose his own religion, but when Christianity had become the religion of the Empire the Church sought the help of the state to suppress h. The Mediaeval Church was ruthless, and sought by every possible means to crush it out, though recent research has shown there was more of it than is sometimes imagined. The Reformation did not involve either dogmatic freedom within the Church nor freedom from persecution by the state. Calvin was as severe as Laud. Many Christian Churches allow a certain latitude of dogmatic interpretation, particularly in modern times. Religious toleration has been gradual, in R.C. countries coming only in the XIX. cent., and it is only partial in Russia to-day. Laws against heretics date from 1400 (Statute *De Heretico Comburendo*). Episcopalian and Puritan harried one another by turns in the XVII. cent.

HEREWARD 'THE WAKE', Eng. patriot who, after the Norman Conquest, long defied the authority of William I., and dwelt secure in the morasses of the Isle of Ely. He was at length subdued, but escaped capture.

HERFORD. OLIVER (1863), author. Educated at Lancaster College, England and Antioch College, Ohio; studied art at Julien's Academy, Paris, and Slade School, England. Author of *Alphabet of Celebrities*, 1899; *A Childs Primer of Natural History*, 1899; *More Animals*, 1900; *Rubaiyat of a Persian Kitten*, 1904; *The Fairy God-Mother-in-Law*, 1905; *The Astonishing Tale of a Pen and Ink Puppet*, 1907; *Hearticulture*, 1908; *Simple Geography*, 1909; *Cupid's Fair Weather Book*, 1909 *Peter Pan Alphabet*, 1909; *The Mythological Zoo*, 1914; *Jingle Jungles*, 1915; *Cynic's Calendar*, 1917; *The Laughing Willow*, 1918; *The Giddy Globe*, 1919; *The Herford Æsop* 1921.

HERGESHEIMER, JOSEPH (1880) Author. *B.* in Philadelphia, Pa.; studen of Quaker School and Pennsylvani Academy of Fine Arts. Author: *Th Lay Anthony*, 1914; *Mountain Bloo* 1915; *The Three Black Pennys*, 1917 *Gold and Iron*, 1918; *Java Head*, 191 *The Happy End*, 1919; *Linda Condo* 1919; *Steel*, 1920; *San Christobal de H Habana*, 1920; *Cytherea*, 1921. Write for Century, Forum and Saturday Even ing Post. *The Bright Shawl*, 1922; *Jav Head* produced as a motion picture 1922.

HERIOT, GEORGE (1563-1623) Scot. goldsmith; known as 'Jinglin Geordie'; acquired considerable wealt in the exercise of his calling, whic after his death, was devoted to th building and endowment of 'Heriot Hospital', Edinburgh.

HERISAU (47° 23′ N., 9° 17′ E. town, Switzerland. Pop. 16,000.

HERKIMER, NICOLAS (1716-1777 an American soldier, *b.* in New York He was in command in Fort Herkimer N. Y. when he was attacked by Indian and in 1777 was the leader of a militi force sent to relieve Fort Stanwick which was besieged by British and I dians. In the battle of Oriskany whic followed he was mortally wounded. Se ORINSKY, BATTLE OF.

HERKIMER, a village of New York in Herkimer co., of which it is the count seat. It is on the New York Central an Hudson River, and the Otsego and Her kimer railroads, and on the Erie and New York State Barge Canal. It is surrou nded by an extensive dairying country which it is the center. Its industri include the manufacture of knit good office desks, beds, furniture, paper boxe mattresses, etc. Pop. 1920, 10,453.

HERKOMER, SIR HUBERT VO (1849-1914), Bavarian (naturalize Eng.) portrait and subject painte worked for *Fun* and the *Graphic*; e hibited *After the Toil of the Day* at th Royal Academy, 1873; founded school art at Bushey, 1883; among his be pictures are *The Last Muster*, *On Strik* and portraits of Ruskin, Wagner, an Tennyson.

HERMÆ, architectural term for p lars with head, usually that of Herme at the top; large numbers found in G towns where they were objects of wo ship; used as boundaries.

HERMAGORAS (fl. early I. cen

B.C.), Gk. who founded school of rhetoric at Rome.

HERMANN I. (*d.* 1217), landgrave of Thuringia; one of chief figures in Ger. history of his time.

HERMANN, COUNT OF WIED (1477-1552), elector and adp. of Cologne; deposed for introducing Reformation into his dominions.

HERMANN OF REICHENAU (1013 54), Ger. monk of Reichenau and author of *Chronicon ad annum*, 1054.

HERMANNSTADT (Hung. *Nagy-Szeben*), tn., Rumania (45° 48′ N., 24° 8′ E.), chief town of Szeben co., on the Cibin (Szeben), in the S. of Transylvania, at the N. foot of the Carpathians. The principal features are the numerous churches, and the antique town house containing the 'Saxon' archives and a collection of armor. The town also possesses the collections of the Transylvanian Carpathian Soc., and a law academy. Distilling, pottery, soap and candle making, printing, milling, and other industries are carried on. It was in the possession of the Turks from 1663 to 1692. During the World War was captured by Rumanians during their invasion of Transylvania (Sept., 1916); retaken by Falkenhayn (Oct., 1916), after a battle. At the Peace Conference it passed along with Transylvania to Rumania. Pop. 30,000.

HERMAPHRODITUS, deity of both sexes in Gk. mythology. H. in Ovid's *Metamorphoses* was *s.* of Hermes and Aphrodite, and united at her request to a nymph who had fallen in love with him.

HERMAPHRODITISM. See SEX.

HERMAS 'THE SHEPHERD' OF, was written at Rome in the first half of the II. cent., traditionally by H., *b.* of Pius, bp. of Rome. It enjoyed at first a high reputation, and was nearly included in the canonical Scriptures. H. was a prophet, and he represents the Church under the guise of a female figure. The work is arranged under Visions, Mandates, and Similitudes. H.'s function is to deliver a message of repentance, declared to him by an angel. It was probably written at different times; theologically it has Adoptionist tendencies.

HERMENEUTICS (Gk. *hermeneuein*, to explain, from Hermes, Zeus's messenger), art of interpreting the wisdom of the ancients, or divine law

HERMES (classical myth.), known to the Romans as Mercury, the swift-footed messenger of the gods, who also conducted the dead to Hades. He was notorious for cunning and dissimulation, was the patron of commerce, and the god of Eloquence. His parents were Zeus and Maia. He is generally represented as a beautiful, naked youth, bearing a caduceus.

HERMES TRISMEGISTUS, name by which the Greeks denoted the Egyptian god Thoth, looked on as the originator of learning and culture; considered in the early centuries A.D. to be author of many occult treatises known as the Heremetic Books, an encyclopaedia of Gk. learning.

HERMIPPUS (fl. early V. cent. B.C.); Athenian poet who wrote satirical comedies.

HERMIT, one who lives apart from others, a frequent practice of Early Christian saints; Paul, the initiator of the practice. St. Anthony, and St. Jerome are well known. Founder of the pillar h's was Simeon Stylites.

HERMIT-CRAB. See CRAB, MALACOSTRACA, COMMENSALISM.

HERMON (33° 26′ N., 35° 50′ E.); or Jebel-es-Sheikh, highest peak of Anti-Lebanon range, Syria; height, *c.* 9150 ft.; on slopes are ruined temples.

HERMOSILLO (22° 23′ N., 110° 58′ W.), city, capital of Sonora State, Mexico, distilleries, wine, silver; has a mint. Pop. 18,000.

HERNE (51° 34′ N., 7° 15′ E.), town, Westphalia, Prussia. Pop. 60,000.

HERNE, JAMES A. (1839-1901), an American actor and playwright, *b.* in Troy, N. Y. He was on the stage the greater part of his life, but his chief fame rests on his plays, especially Shore Acres, which was one of the most popular pieces every enacted on the American stage. Other well known plays are *Hearts of Oak*, *Drifting Apart*, and *Margaret Fleming*. His *d.* Crystal Herne, was a well known actress.

HERNE THE HUNTER, ghostly huntsman, said to haunt Windsor Great Park by night. He is referred to in Shakespeare's *Merry Wives of Windsor*.

HERNIA is the term in surgery applied to the protrusion of an organ, or part of an organ, through an opening in the wall of the cavity in which it is normally contained; most commonly denoting such a protrusion of an organ of the abdomen, popularly termed 'rupture.' The most common situations of abdominal h. are the groin (inguinal canal), the upper part of the thigh (crural canal), and the naval or umbilicus, and the cause may be either *congenital*, due to arrested

development of certain parts, or to hereditary weakness of the abdominal wall, or *acquired*, from various causes which may weaken the abdominal walls or increase the internal pressure of the abdomen, *e.g.* pregnancy, hard coughing in chronic bronchitis, and similar violent efforts, or injury.

HERNÖSAND (62° 35′ N., 17° 49′ E.), port, Sweden, Pop. *c.* 10,000.

HERO FUND, CARNEGIE. See CARNEGIE HERO FUND.

HERO AND LEANDER (classical myth.), two famous lovers of ancient times. H. was priestess of Aphrodite, at Sestos, and L. a handsome youth of Abydos, who nightly swam the Hellespont to visit his love, guided by a lamp; on a night of storm, the lamp was extinguished, and L. drowned. H., in despair, cast herself into the sea.

HERO OF ALEXANDRIA (I. or II. cent. B.C.), Gk. mathematician and writer on mechanical and physical subjects; invented, as toys, number of machines and automata; wrote *Catoptrica* (on reflecting surfaces). three books on *Mechanics*, *Pneumatica* (descriptions of his machines), *Automatopoietica*, and numerous treatises on *Geometre*.

HEROD, princes of Judaea. H. the Great, was appointed king of all Judaea in 40 B.C., and in 37 B.C. he took Jerusalem and deposed Antigonus, the last Asmonaean prince; he rebuilt Temple, and laid out a new palace on Zion; had great numbers of his relatives put to death, and ordered massacre of Innocents; *d.* in 4 B.C.—H. Antipas, tetrarch of Galilee and Peraea; beheaded John the Baptist; deposed 40 A.D.—H. Philip, tetrarch of region beyond Jordan; founded Caesarea Philippi; m. Salome, *d.* 33 A.D.—H. Agrippa I. *d.* 44 A.D., king of Judaea; *s.* of Aristobulus; *g.s.* of H. the Great; Caligula showered honors and favors upon him, and he became one of the most powerful kings of the East; imprisoned St. Peter, and put James, *b.* of John the Evangelist, to death; according to *Acts* 12, *d.* 'eaten of worms.' H. Agrippa II. *d. c.* 100 A.D., *s.* of H. Agrippa I., last king of H. the Great's line; appears in *Acts* 26.

HERODAS, HERONDAS (III. cent. B.C.), Gk. poet and writer of mimes; probably native of Cos. A papyrus with seven mimes of H. was discovered in 1890. The scenes are very lively and vivid.

HERODIANS, associated by Christ with the Pharisees for condemnation (*Mark* 8_{15}; cf. 3_6); supposed to have been a Jewish political party in favor of Herod, king of Judaea, 37-4 B.C.

HERODIANUS, Gk. historian; fl. during first half of III. cent. A.D., and wrote a valuable narrative of his period.

HERODIANUS, ÆLIUS (fl. II. cent. A.D.), Alexandrian scholar whose treatises on Gk. prosody and style are valuable.

HERODIAS, the *g.d.* of Herod the Great and Mary Marimne. She first married her uncle, Herod Philip, and afterwards left him and lived with her *b.*, Herod Antipas. Through her scheming Herod was persuaded to put to death John the Baptist, who had denounced the relations between her and Herod.

HERODOTUS (*c.* 490-420 B.C.), early Gk. historian, generally regarded as the father of history; *b.* at Halicarnassus, Asia Minor; during his youth occurred the great uprising of Greeks against Persians; spent many years in travelling, visiting Egypt, Babylon, Greece, and other countries, and was thus able to give lifelike descriptions of the various peoples mentioned in his history. The latter is an account of the great victory of Greeks over Persians, and is also an epitome of the life and thought of the time; the main theme is preceded by a lengthy introduction which relates the earlier history of both nations, and gives incidentally long accounts of many other great nations with which they came in contact. The part dealing with his own times is of great hist. value, but much of his work on earlier periods is untrustworthy. His style is unstudied and harmonious, and is praised by both ancient and modern writers.

HEROIC, THE (Gk. *heros*, a superior being). Nearly every country has its h. age, in which men performed more than mortal feats. Historians have not yet decided whether the hero should be regarded as an original god or the god as a deified hero, but there is a strong current of opinion in favor of the latter view. Science has done much of late years in sifting the myths and obtaining a historical residuum, Niebuhr's treatment of early Rom. history marking an epoch in this process. The result has been, so far, to establish a line of demarcation. the h. being claimed for history, the mythical remaining among religions. Thus, so far, efforts to humanise Zeus and Woden have failed, but the heroes of Greece and Troy, whose deeds are sung in Homer, receive a place in modern accounts of Ægean civilisation, and the symbolism of the stories of regal Rome has been so

plausibly explained as to be generally accepted as historial.

The h. in romance again, is very valuable for history. Charlemagne is mentioned by name in the *Chanson de Roland*, but in many cases pseudonyms are given, sometimes well-known (for instance, Dietrich of Bern, hero of a cycle in the XIII. cent. *Heldenbuch*, is Theodoric).

HEROIC VERSE amongst the Greeks and Romans was the hexameter measure used by Homer, and Virgil; synonymous term amongst the Fr. for Alexandrine verse; in Eng. verse it is the name given to two-rhymed iambic lines, each consisting of ten syllables. It was first popularised by Chaucer; was the favorite measure of Dryden and Pope; but sank into disfavor in the early part of the XIX. cent. See COUPLET.

HERON (ARDEA CINEREA), a large marsh bird with long legs and a stout, powerful beak; plumage slaty grey above, with pale breast and neck, whilst head is characterised by a dark crest. The h. is a voracious feeder, devouring eels, fish, worms, water-voles, field-mice, which it impales on its beak. The breeding haunts are termed heronries, and the nests are large, flat structures, built in groups in high trees. H.-hawking was a favorite sport in falconry.

HERPES, inflammation of the skin, accompanied by the appearance of vesicles on the surface, due to inflammation of the cutaneous nerve supplying the part; *herpes labialis* occurs about the lips in acute fevers, pneumonia, or even in a severe cold, soon passing away; *herpes zoster* usually occurs on the body along the course of an intercostal nerve, neuralgic pain usually preceding the eruption.

HERRERA, FERNANDO DE (*c.* 1534-97), Span. poet who introduced Ital. Renaissance into Spain.

HERRERA, FRANCISCO (1576-1656), the elder, and his *s.*, Francisco H., the younger (1662-85), Span. painters; the former famous for depth in subject and treatment, and founder of a Span. school.

HERRERA Y TORDESILLAS, ANTONIO DE (1549-1625), Span. historiographer-royal; wrote history of early Span. colonies in America.

HERRICK, MYRON T. (1855), U. S. ambassador; *b.* Huntington, Ohio. He graduated from Ohio Wesleyan University and studied law at Cleveland, where he practised from 1878 to 1886. Afterwards he engaged in large banking, railroad and manufacturing enterprises and entered politics as a Republican. In 1903 he was elected governor of Ohio, and from 1912 to 1914 served as ambassador to France, where he became an outstanding American figure during the early stages of the World War. He promoted the establishment of the American ambulance hospital in the Elysée Pasteur at Neuilly and organized the American Relief Clearing House. The French government bestowed on him the grand cross of the Legion of Honor and the British government presented him with a piece of old English plate as a tribute to his war services to their nationals. Honorary degrees of LL.D. were also conferred on him by Columbia, Harvard, Yale, Princeton and other seats of learning.

HERRICK, ROBERT (1868), university professor and novelist; *b.* Cambridge, Mass. He graduated from Harvard in 1890, then taught at the Massachusetts Institute of Technology and afterwards at the University of Chicago, where in 1905 he was appointed professor of English. He wrote a number of novels, beginning with *The Man Who Wins*, 1895; and including *The Common Lot*, 1904, one of the most outstanding of his productions.

HERRICK, ROBERT (1591-1674), English poet; *b.* London; *d.* Dean Prior, Devonshire. He was the *s.* of a goldsmith and studied at Cambridge, becoming a chaplain. In 1629 he became vicar of Prior Place, Devon, but in 1647 was ejected from his parish by Parliamentary troops owing to his royalist sympathies. Upon the restoration of Charles II. in 1662 he was reinstated to his old living. As a poet his viewpoint was pastoral and idyllic. He also wrote religious poems, but the main body of his work was amatory and descriptive, much of it of an exquisite lyrical quality and of perfect form. A number of his lines survive, as fresh and as melodious as when written, in present-day anthologies, among them *Cherry Ripe*, and *Gather Ye Rosebuds*. His literary mentor was Ben Johnson. His poems were collected and published under the titles of *Hesperides* and *Noble Numbers*.

HERRIN, a city of Illinois, in Williamson co. It is on the Burlington and Quincy, the Illinois Central and the St. Louis, Iron Mountain and Southern railroads. It is the center of an important coal mining region and its industries include machine shops, foundries and a powder plant. In 1922 riots between striking miners and strike breakers resulted in the killing of 50 non-union miners after they had surrendered their

arms. The leaders of the mob were indicted and tried in 1923. The result of the trials was acquittal.

HERRING FAMILY (*Clupeidoe*), the most valuable of all groups of fishes, on account of their importance as food fishes. They are marine and surface feeders and are taken in drift nets. Most are small fishes, with large, thin, silvery scales and without a lateral line, but the related Mexican Silver-King, or Tarpon, a favourite game-fish, may reach a length of 6 feet. The Menhaden (*Brevoortia tyrannus*) is one of the most valuable of Amer. fishes. Its young are preserved as 'sardines.' The egg of the herring is one of the few fish eggs that do not float. The smaller Sprat (*c. sprattus*), with serrated belly, the young of which, with those of the herring, are known as 'Whitebait'; the silver and green Pilchard (*C. pikchardus*), the young of which are Sardines; the Shad, which may weight 8 lb., and spawns, like the Salmon, in rivers; and the Anchovy.

HERRING-BONE, term in masonry for arrangement of bricks in h.-b pattern.

HERRINGS, BATTLE OF THE (Feb. 12, 1429), so called because of Eng. force, under Sir J. Fastolf, carrying provisions to Orleans, defended themselves behind barrels of herrings, and repulsed a Fr. attack under Comte de Clermont.

HERSCHEL, CAROLINE LUCRETIA (1750-1848), the sister of Sir William H., whom she assisted in his astronomical observations, *b.* in Hanover, She lived with her brother at Bath from 1772, and acted as his assistant when he was appointed astronomer-royal. Between 1786-97 she discovered eight comets, five undoubtedly unobserved before, and many of the smaller nebulae and star clusters included in her brother's catalogue were her discoveries. In 1798 she published for the Royal Society, *Catalogue of Five Hundred and Sixty-one Stars observed by Flamsteed.* In 1828 the Astronomical Society awarded her their gold medal, and elected her an honorary member in 1835.

HERRNHUT (51° 1′ N., 14° 45′ E.), town, Saxony, Germany; Moravian sect established colony here, 1722. Pop. 1,500.

HERSCHEL, SIR JOHN FREDERICK WILLIAM, BART. (1792-1871), Eng. astronomer; only *s.* of Sir William H.; *b.* Slough (Bucks); grad. at Cambridge, 1813, and was Senior Wrangler and Smith's Prizeman; spent some time after his *f.s* death reviewing the nebulae and star clusters his *f.* had discovered; to these he added several hundreds more, and made observations on over 3,000 double stars; set up at his own expense an observatory near Cape Town, 1834, and there completed his survey of the whole heavens, publishing his results in 1847.

HERSCHEL, SIR WILLIAM (1738-1822), astronomer; *b.* Hanover; came to England, 1757, and held various musical appointments, studying maths. and astron, in spare time; began 1779 systematic survey of individual stars with a 7-ft. reflecting telescope constructed by himself; discovered, 1781, planet *Uranus* (being thereupon granted a pension of £400 a year), and later its satellites. He also discovered two of *Saturn's* satellites, and observed the phenomena of its rings. In 1787 he completed the erection of a 40-ft. reflector at Slough (Bucks), and continued his studies there.

HERSCHELL, FARRER, 1ST BARON HERSCHELL (1847-99), Eng. Lord Chancellor; *b.* at Brampton, Hants; called to Bar, 1860; app. Q.C., 1872; Recorder for Carlisle, 1873-80; M.P., 1874; Solicitor-Gen. under Gladstone, 1880; defeated for Lonsdale in general election of 1886, but in same year was app. Lord Chancellor and raised to the peerage; again sat on the Woolsack, 1892-95; Chancellor of London Univ., 1893; G.C.B., 1893. While in Washington, as pres. of Anglo-Amer. boundary commission, he met with accident which resulted in his death, 1899.

HERSTAL, HERISTAL (50° 41′ N., 5° 38′ E.), town, Belgium; centre of iron and steel manufactures. Pop. 22,000.

HERTFORD (51° 48′ N., 0° 5′ W.), town, Hertfordshire, England; has castle originally built in X. cent.; in neighbourhood is Haileybury Coll. Pop. 1921, 10,712.

HERTFORDSHIRE, HERTS (51° 45′ N., 0° 15′ W.), county, England; bounded N. by Cambridge, E. by Essex, S. by Middlesex, S.W. by Buckingham, N.W. by Bedford; area, *c.* 634 sq. miles. Beautiful undulating county of hills, valleys, parks, and woods; in N. is branch of Chiltern Hills, highest being Kensworth Hill. Principal rivers are Lea, Stort, Colne, Maran, and artificial New River; chief towns, Hertford (capital), St. Albans, Hemel Hempstead, Watford, Hitchen, Bishop Stortford, and Ware. Wheat principal grain grown; water-cress, fruits, roses cultivated; stock raised; manufacturing industries small; brewing at Watford; straw-plaiting, paper-making, tanning, and brick-making carried on. Grand

Junction Canal crosses S.W. part of county.

H. contains battlefields of St. Albans and Barnet; Waltham Cross and St. Albans Abbey. Pop. 1921, 333,236.

HERTHA, NERTHUS, in Teutonic myth, the personification of the Earth; worshipped by Norsemen, Germans, and A-Sasons.

HERTLING, GEORG, COUNT VON (1843-1919), Ger. writer and politician; became prof. in the univ. of Munich and wrote several historical and philosophical works; entered Reichstag in 1875; employed by Bismarck during the Kulturkampf to secure concessions from Rome, and was leader of the Catholic centre. In 1911 became president of the council and minister of foreign affairs in kingdom of Bavaria, but was gradually drawn towards Prussia and labored for the supremacy of that country; succeeded Dr. Michaelis as Ger. Chancellor (Nov. 1917), and held that office when treaties of Brest-Litovsk and Bukharest were made. He retired in Oct. 1918.

HERTZ, JOSEPH HERMAN (1872), a Jewish theologian rabbi and chief rabbi of the United Hebrew Congregation of the British Empire. He was *b.* at Rebrin, Hungary, and as a child emigrated to New York City, where he received his education. He was rabbi at Syracuse, N. Y. until 1898 and from that year to 1911 at Johannisburg. In 1912 he was rabbi of a church in New York City and in the year following was chosen chief rabbi of the British Empire. His published works include *Ethical System of James Martineau, The Jew in South Africa,* and *Book of Jewish Thoughts.*

HERTZ, HEINDRICH RUDOLF (1857-94), Ger. physicist; was assistant to Helmholtz and later prof. of Physics at Carlsruhe Polytechnic. *Wireless telegraphy* is a practical application of one of his investigations. He demonstrated the similarity between *electromagnetic, light,* and *heat waves,* and worked at *electric discharges* in gases.

HERTZBERG, EWALD FRIEDRICH, COUNT VON (1725-95), Pruss. lawyer and politician; after holding several posts in government service, he became chief minister in 1763; supported foreign policy of Frederick the Great, and for several years guided policy of Frederick William II.; dismissed from office for opposing the king in his dealings with Great Britain, Poland, and Russia, 1791; wrote on Ger. lit.

HERTZEN, ALEXANDER (1812-70), Russ. author; *b.* Moscow; banished as political offender, 1834; left Russia, 1847, and lived in Italy, Geneva, London, Paris, where he died; best works, *Kto Vinovat,* novel; political works. *Baptized Property, Kolokol, Golosa iz Rossii* (Voices from Russia), etc.

HERULI, Teutonic people said to have been driven S. when the Danes settled in Denmark; allied with the Goths against the Rom. Empire.

HERVÈ, GUSTAV (1871), a French Socialist leader, *b.* near Brest. For many years he was professor of history of the University of Sens, but the publication of pacifist articles in 1901 brought about his dismissal. In 1905 he was imprisoned for opposing compulsory military service, and was, in the years following, several times arrested and imprisoned for the same offense. He incurred strikes among the working men and upheld sabotage. He was considered the most radical of French Socialists. When France declared war against Germany, however, he heartily supported the government and took part in military service.

HERVEY ISLANDS. See COOK ISLANDS.

HERVEY, JAMES (1714-58), Anglican clergyman who played part in Methodist revival; author of *Meditations among the Tombs,* 1745.

HERVIEU, PAUL ERNEST (1857-1915), Fr. psychological novelist and dramatist; great originality and charm of style; among his novels are *Diogene-le-Chien,* 1882; *Flirt,* 1890; *L'Armature,* 1895; and his plays include *Les Paroles restent,* 1892; *La Course du Flambeau,* 1901; *Le Reveil,* 1905; and *Connais-toi,* 1909; his works deal chiefly with sex problems.

HERWARTH VON BITTENFELD, KARL EBERHARD (1796-1884), Pruss. field-marshal; commanded right wing at Königgrätz and directed movements of 1870.

HERZEGOVINA. See BOSNIA-HERZEGOVINA.

HERZEN, ALEXANDER (1812-70), a Russian author and publisher, *b.* at Moscow. In 1835 while still a student he was tried and exiled to Viatka for a too free expression of his political views. In 1840 he returned to St. Petersburg and held an official post, but in consequence of too great frankness he was sent to Novgorod in 1842, and left Russia in 1847 to pass the remainder of his life between Paris, London and Geneva. In London he established his *Free Russian Press* from which emanated a large

number of works dealing with the cause of reform in Russia and the periodicals *Bell* and *Polar Star*, which were smuggled into Russia and obtained an enormous influence. When the Polish insurrections of 1863 broke out, H. espoused the insurgents' cause, and lost his influence in Russia. He wrote *Memoires de L'Imperatrice Catherine II.*, 1869, and some novels, as well as his political works. His collected Russian works were published at Geneva in 1870.

HERZL, THEODOR (1860-1904), Jewish politician; *b.* at Budapest; founded Zionist movement, and in 1896 wrote *Der Judenstaat*, advocating the establishment of a Jewish autonomy in Palestine; to this end he organised a number of congresses at Basel.

HERZOG, JOHANN JAKOB (1805-82), Ger. ecclesiastical historian; prof. of Theology at Halle, then at Erlangen.

HESEKIEL, JOHANN GEORG LUDWIG (1819-74), Ger. author; famed for his patriotic songs, pub. under title of *Preussenlieder* and *Neue Preussenlieder*; *Lofe of Bismarck*, etc.

HESILRIG, SIR ARTHUR (*d.* 1661), Eng. politician and soldier; Roundhead in Civil War; raised cavalry force for Parliament; conducted defence of Newcastle, 1647-48; imprisoned at Restoration, and *d.* in Tower.

HESIOD (*c.* VIII. cent. B.C.), one of the earliest Gk. poets; *b.* Ascra, in Boeotia. His poems are (1) *The Works and Days*—a didactic work on peasant life; (2) *The Theogony*—an account of the origin of the gods and heroes; (3) *The Shield of Hercules*—a description of the hero's shield, in imitation of Homer's account of the shield of Achilles; exemplar for Vergil.

HESPERIDES, THE (classical myth.), three maidens, Ægle, Arethusa, and Hesperia, *d.'s* of Erebus (darkness) and Nox (night); guardians together with the hundred-headed dragon, Ladon, of the tree bearing golden apples, which was presented by Gaea (Earth) to Hera, on her marriage with Zeus.

HESPERUS, Gk. name for planet Venus when seen as evening star.

HESS, HEINRICH HERMANN JOSEF, BARON VON (1788-1870), Austrian field-marshal; won laurels as chief-of-staff to Radetzky in Italy.

HESS, KARL ERNST CHRISTOPH (1755-1828), Ger. engraver, whose three sons, Peter 1792-1871, Heinrich Maria, 1798-1863, and Karl, 1801-75, were prominent painters.

HESSE, republic of Germany, (50° 30′ N., 9° E.), in S.W. of Prussia, comprising the provinces Oberhessen, Starkenburg, Rheinhessen, and eleven small enclaves; watered by Rhine, Lahn, Main, Fulda; chief towns—Darmstadt (cap.), Giessen, Mainz, Wörms, Offenbach; has famous mineral springs, iron, salt, manganese ore; industries—leather goods, chemicals, furniture, hardware and machinery, tobacco, beer. Hesse ruled by landgraves from 13th cent. till 1567; then divided into Hesse-Kassel, Hesse-Darmstadt; Hesse-Marburg, etc., which by 1866 were annexed by Prussia, with exception of Hesse-Darmstadt, from that date simply known as Hesse. Formerly a grand-duchy, the state was proclaimed a republic in Nov. 1918. Area, 2,966 sq. m.; pop. 1919, 290,988.

HESSE-DARMSTADT (50° 15′ N., 9° E.), former grand-duchy of Germany, formed by division of Hesse, 1567; since 1866 known simple as Hesse.

HESSE-HOMBURG, old landgraviate, Germany; incorporated with Prussia, 1866.

HESSE-KASSEL, now part of Prussian province of Hesse-Nassau (51′ N., 9° 20′ E.), formed by the division of Hesse, in 1567, and founded by William IV. (the Wise); ruled by landgraves until 1803; then Landgrave William IX., having fought against French, received title of Elector; Elector Frederic William having sided with Austria, Hesse-Kassel was annexed to Prussia (1866).

HESSE-NASSAU (*c.* 51° N., 9° E.), Pruss. province, Germany; area, 6,062 sq. miles; magnificent forests; wine, fruits; mineral springs. Pop. 1919, 2,273,502.

HESSE-ROTENBURG, former landgraviate, Germany; partly incorporated with Hesse-Cassel, 1834.

HESSIAN-FLY OR CECIDOMYIA DESTRUCTOR, the name of a species of dipterous insects belonging to the family Cecidomyiidae; they are minute fragile flies, having very few wing nervures; the elongated antennae are furnished with rings of hairs. This fly does great injury to crops, and in some parts of the world causes considerable loss when it has once attacked cereals; the larvae is lodged at a point in the stem of the wheat enfolded by a leaf; the stem consequently weakens and bends. When about to pupate, the larvae of *C. destructor* exudes a substance from its skin and this forms a remarkable cocoon, which is called flax-seed.

HESSIANS, the name given to mercenary troops from the German States,

and especially from Hesse-Cassel, employed by George III. in 1775 against the American colonies. In many instances their conduct was extremely brutal. Some of them, taken prisoners, settled in the United States after the war.

HESTIA, Gk. goddess of the hearth. The hearth in the city prytaneum was sacred to H., and the fire never allowed to become extinct; brands were taken from it to light the city fire in a new colony.

HESYCHASTS (Gk. *hesychazein*, to be quiet), name given to a Greek sect which arose among monks of Mount Athos in XIV. cent.

HESYCHIUS (fl. IV. or V.cent. A.D.), Gk. philologist of Alexandria.

HESYCHUS OF MILETUS (fl. V. cent. A.D.), Byzantine historian.

HETEROMERA, a sub-order of beetles, with five joints on tarsi of fore and middle legs and four on hind legs. It includes the Tenebrionidae, with the common 'meal-worm,' the larva of *Tenebrio molitor*; the churchyard beetles (*Blaps*), whose funereal appearance, and habits of frequenting dark places and of feeding upon animal refuse, have gained them their name; the blister and oil beetles (Cantharidae), which often contain an irritant capable of blistering the skin.

HETEROPTERA. See HEMIPTERA.

HETMAN (Russian *Ataman*), a Polish word used as military title for the commander-in-chief of their army when the king was not present. It was adopted by Russian as a title for the head of the Cossacks (*q. v.*), and once held by the Cesarevitch. It is also used for the elected elder of the *Stanitsa* in Cossack administration. See COSSACK.

HEUGLIN, THEODOR, BARON VON (1824-1876), a German traveler and explorer. He made many trips in Africa and the Soudan. He also made a journey to Spitzbergen and Nova Zembla. He published several volumnes of African travel and natural history.

HEVELIUS, JOHANN (1611-87), Ger. astronomer; studied sun-spots; discovered four comets, and suggested revolution of such bodies round the sun; founded lunar topography.

HEWITT, ABRAM STEVENS (1822-1903), ironmaster and social reformer; *b.* Haverstraw, N. Y. He was educated at Columbia College, where he later taught mathematics. He also studied law, and was admitted to the bar in 1844, but abandoned the legal profession to engage in the manufacture of iron and steel in partnership with Edward Cooper, *s.* of Peter Cooper (*q.v.*). The firm (Cooper and Hewitt) was the first to mould iron girders and supports for fireproof buildings and bridges and promoted the introduction of the open-hearth process of making steel into the United States. In 1886 he was elected mayor of New York City, defeating Henry George and Theodore Roosevelt. Previously he had served several terms in Congress. As a democrat he supported Tilden's claim to the presidency in 1875, when he was chairman of the National Democratic Committee. He aided many institutions by bounteous gifts, especially the Cooper Union Institute (*q.v.*), founded by his father-in-law, Peter Cooper.

HEWITT, PETER COOPER (1861-1921), manufacturer and inventor; *b.* New York City; *s.* of Abram Stevens Hewitt and *g.s.* of Peter Cooper. He was educated at Columbia and at Stevens Institute, Hoboken, specializing in electrical engineering. Entering business with his father, he became a director of the Cooper-Hewitt and several other corporations and a trustee of Cooper Union. As an electrical engineer, he invented the mercury vapor lamp and the mercury vapor rectifier that bear his name, and a number of other mechanical appliances. He invented also devices to simplify the processes of manufacturing glue at the Peter Cooper factory; also a hydroplane, improved methods of hatching fish, and developed the use of mercury vapor in the operation of wireless telegraphy.

HEWLETT, MAURICE HENRY (1861-1923), Eng. novelist and poet; keeper of Land Revenue Records and Enrolments 1896-1900; pub. essays, *Earthwork out of Tuscany*, 1894; *The Masque of Dead Florentines*, 1895; then *Songs and Meditations*, 1897; first novel, *The Forest Lovers*, 1898, followed by *Richard Yea-and-Nay*, *The Queen's Quair*, *The Stooping Lady*, *Halfway House*, *Love and Lucy*, and many others; poems include *Song of Renny*, *Song of the Plow*, etc.; an interpreter of mediaevalism and of the English countryside.

HEXAMETER, dactylic measure, and the noblest of the Gk. and Roman verse measures, used by Homer and Vergil and other early poets. The form has been used in Ger. poetry and also in Eng. poetry, the best examples of the latter use being Kingsley's *Andromeda*, Clough's *Bothie*, and Longfellow's *Evangeline*.

HEXAPLA (the sixfold), an edit. of the Old Testament by Origen (fl. III. cent.), giving six versions.

HEXATEUCH, the Pentateuch and the Book of *Joshua*, joined to the Pentateuch as also treating of the conquest of Canaan.

HEXHAM (54° 58′ N., 2° 7′ W.), town, Northumberland, England, on Tyne; quaint old market town with narrow streets; most interesting feature is Abbey Church, with remains of ancient monastery; site of battle between Yorkists and Lancastrians, 1464; manufactures gloves and leather; coal and baryte mines near; trade chiefly agricultural. Pop. 10,000.

HEYN, PIETER PIETERZOON (1578-1629), Dutch admiral; seized Span. bullion fleet, 1628; killed in action against Dunkirk pirates.

HEYNE, CHRISTIAN GOTTLOB (1729-1812), a German classical scholar, *b.* at Chemnitz in Upper Saxony. Although very poor, he was a student at Leipzig University, and in 1753 obtained a post in the Bruhl Library, Dresden. His edition of *Tibullus* which appeared in 1755, secured him the support of Ruhnken of Leyden, and although he suffered many vicissitudes during the Seven Years' War, the scholar was instrumental in obtaining for him, in 1763, an appointment as professor at Göttingen. His other works include editions of the *Enchiridion* of Epictetus; Virgil, 1767; Homer, Pindar, and Apollodorus, as well as many reviews of books. See LIFE BY LUDWIG HEEREN, 1813.

HEYSE, PAUL JOHANN LUDWIG (1830-1914), Ger. poet, dramatist, and novelist; renowned for his Novellen (short stories), such as *L'Arabbiata*; has also written fine lyrics, several narrative poems, and about thirty plays; Nobel prize, 1910.

HEYWOOD (53° 35′ N., 2° 14′ W.), town, Lancashire, England. Pop. 1921, 27,280.

HEYWOOD, JOHN (*c.* 1497-1580), Eng. dramatist and epigrammatist; a distinguished writer of interludes, amongst which were *The Play of Love*, *The Pardoner and the Frere*, and *The Play of the Wether*. He was also author of many noted epigrams.

HEYWOOD, THOMAS (*d.* 1650), Eng. dramatist; very voluminous and popular writer of plays chiefly with a domestic interest; his best include *A Woman killed with Kindness*, 1603; *Rape of Lucrece*, 1608; *Fair Maid of the Exchange*, *Love's Mistress*; also wrote *An Apology for Actors*.

HEZEKIAH (fl. VIII. to VII. cent. B.C.), king of Judah; had great difficulty in putting down revolts of subject states; Bible relates how Sennacherib of Assyria invaded Judah and lost 180,000 men in single night by stroke of the 'angel of the Lord,' but episode is doubtful. H. was famous prophet and administrator; builder of aqueducts at Jerusalem.

HIATUS (Lat. gap), term in logic for break in chain of reasoning; generally, temporary pause.

HIAWATHA, a legendary superman immortalized in the mythology of the Iroquois tribe of American Indians, and the subject of a narrative poem of Longfellow's bearing his name. He was supposed to have been of miraculous birth and to have come among the Indians on a civilizing mission. They credited him with having instructed them in the science of medicine and of navigation and to have produced maize (Indian corn) as a food, but with the appearance of a white man on American soil he disappeared in an ascension to the land of the Hereafter, called the kingdom of Ponemah. Schoolcraft's *Algic Researches* perpetuates the legend, but makes Hiawatha an Ojibway Indian. Longfellow based his poem in the story, which resembles the Finnish epic *Kalevala*.

HIBBEN, JOHN GRIER (1861), University president; *b.* Peoria, Ill. Graduating from Princeton in 1882, he studied for the ministry at the Theological Seminary of that university, and also at the University of Berlin. In 1887 he was ordained and occupied the pastorate of the Presbyterian church in Chambersburg, Pa. until 1891, when he returned to Princeton as instructor in logic and psychology, becoming professor of logic in 1903. In 1912 he was elected president of the university in succession to Woodrow Wilson upon the latter's resignation to take office as President of the United States. His writings comprise mainly essays on logic and philosophy and he edited, 1905, *Epochs of Philosophy*, 12 vols. France made him an officer of the Legion of Honor.

HIBBERT LECTURES, a series of lectures founded by trustees of Robert Hibbert, 1770-1849, a Jamaica merchant who conveyed to trustees, 1847, 50,000 dollars to found scholarships and fellowships, lectures being included since 1878; the first series was delivered by Max Müller.

HIBBING, a city of Minnesota, in St. Louis co. It is on the Missabe and Northern, and the Great Northern railroads. It is in the great Mesabe iron ore range which is the most productive in the

United States, and is the chief shipping point for iron ore from this range. Within the city limits are five important mines. Pop. 1920, 15,089.

HIBERNATION, the state of quiescence or torpor in which many organisms tide over natural conditions unfavorable to their active life. The state of h. has much resemblance to a deep and prolonged sleep, and indeed sleep is often the starting-point which leads to h.; but there are great differences between the two types of unconsciousness. In h. the functions of the body are so reduced that the animal becomes practically inanimate, nutrition ceases, respiration is almost stopped, and, most strange of all, the body termperature, which may have been anything from 35° to 40° C. in mammals, falls almost to that of the surrounding air, with the fluctuations of which it now fluctuates. Almost the first moment of awaking, however, restores the lowered temperature to its normal pitch.

HIBERNIA (ALSO IERNE), ancient Rom. name for Ireland.

HIBERNIANS, ANCIENT ORDER OF. A Catholic Irish organization. The original purpose of the society was to protect the Catholic faith and priesthood in Ireland, but later it developed into a charitable and benevolent society, while politically working for the independence of Ireland. Some writers say that it originated about 1642 after the revolt in the North, and others in 1661 when Cromwell outlawed the Irish people and forbade Catholic worship. It is well established that Rory O'Moore founded the society as it is today sometime in the 17th century when it was known as The Defenders. The present name was adopted after Catholic Emancipation in 1829. The society spread to England and Scotland, to the United States in 1836, and later to Canada, Mexico and Hawaii. Since 1884 National Conventions of the order have been bi-annual. It supports the Gaelic League, and endowed a Celtic Chair at the Catholic University of America. A Ladies Auxiliary was founded at the National Convention, Omaha, in 1894. The society expends over a $1,000,000 a year in sick and death benefits. National president in 1923, J. E. Deery, Indianapolis. Membership 43,666.

HIBISCUS, genus of plants of order Malvaceae, usually tropical or sub-tropical; *H. syriacus* grows in the open in America; *H. cannabinus* (Ambare hemp) is an Ind. plant, fibre being often known as Bombay hemp; *H. abelmoschus* is used in India for clarifying sugar.

HICCUP, HICCOUGH OR SINGULTUS, is a sudden spasmodic contraction of diaphragm, accompanied by closure of glottis, caused by abnormal stimulation of any part of phrenic nerve; is a reflex act frequently following irritation of mucous membrane of stomach, and usually easily cured by holding breath, or by a draught of cold water. When persistent it may be symptomatic of a serious condition—*e.g.*, peritonitis—and is also common in last stages of exhausting illness.

HICHENS, ROBERT SMYTHE (1864), Eng. novelist; gave up music for literature; won recognition with *The Green Carnation*, 1894; and since then has pub. *An Imaginative Man, Flames, The Woman with the Fan, The Garden of Allah* (successfully dramatized, 1920), *The Call of the Blood, Barbary Sheep, Bella Donna, Snake Bite*, 1919; *Mrs. Marden*, 1919, etc.; collaborated with Wilson Barrett in successful play *The Daughters of Babylon*, and has produced stage versions of his own stories.

HICKORY, an Amer. tree, genus *Carya*, with strong elastic wood, easily decayed by worms and moisture, but greatly valued as fuel; used for golf-clubs, hammer and tool handles.

HICKS, ELIAS (1748-1830), Amer. Quaker and anti-slavery agitator.

HICKS-BEACH, SIR MICHAEL. See St. Aldwyn, Viscount.

HIDALGO (Span. *hijo de algo*, s. of something), Spaniard of gentle birth.

HIDALGO (*c.* 20° 30′ N., 98° 45′ W.) state, Mexico; gold, silver, cereals, coffee. Pop. 645,000.

HIDALGO Y COSTILLO, MIGUEL (1753-1811), Mexican priest; led revolt against Spaniards; defeated at Calderon Bridge; put to death.

HIDE, the space that might be ploughed with a single plough, and would suffice to maintain a family or the household of a mansion-house. Authorities are not agreed upon the exact area. In Anglo-Saxon times and in Domesday Book the h. is given at 30, 40, 50, and 80 acres.

HIDES. See Skins, Leather.

HIEMPSAL II. (fl. I. cent. B.C.), king of Numidia; deposed, but reinstated by Romans under Pompey.

HIERAPOLIS.—(1) ancient ruined town in N.E. Syria, on high road from Antioch to Mesopotamia; possessed great temple, and was once one of the chief seats of worship of Astarte. (2) ancient city of Great Phrygia, lying

between Lycus and Meander and near Laodicea and Colossae; possessed temple to Cybele, and hot springs; early seat of Christianity, Church being founded by St. Paul.

HIERARCHY, government in sacred things; applied to varying ranks of Church officers.

HIERATIC, term given to a more cursive form of Egyptian hieroglyphics.

HIERAX (fl. *c.* 300), Egyptian Biblical commentator, who exercised strong influence for asceticism in the early Church.

HIERO, name of two tyrants of Syracuse.—H. I. defeated Etruscans, 474 B.C.—H. II. made treaty with Rome, 263 B.C.

HIEROCLES OF ALEXANDRIA (V. cent. B. C.), Gk. philosophical writer.

HIEROGLYPHICS, name given to figures sculptured or written on Egyptian monuments and papyri, and found on monuments of the Aztecs; translation found by the Rosetta Stone 1799. See CUNEIFORM WRITING.

HIERONYMITES, order of hermits whose rule was founded on the Augustinian; established in Italy and Spain, XIV.-XV. cent.

HIERONYMUS OF CARDIA (fl. IV. cent. B.C.), Gk. commander under Alexander the Great and his successors; his history is chief historical source of the period.

HIERRO, FERRO (27° 43′ N., 18° W.), island, Canary Isles (*q.v.*), Atlantic. Pop. 6,000.

HIGDON, (HIGDEN), RANULF (*c.* 1300-*c.* 1363), Eng. chronicler; monk of Chester and author of the excellent *Polychronicon.*

HIGGINSON, ELLA. Author, *b.* at Council Grove, Kans. Educated in private schools and Oregon City Seminary. Conductor of literary department of Seattle Sunday Times. Writes verse, novels, and short stories. Author: *The Flower that Grew in the Sand,* 1896; *A Forest Orchid,* 1897; *From the Land of the Snow Pearls,* 1897; *When the Birds Go North Again,* (poem), 1898; *Mariella of Out-West,* 1904; *The Voice of April-Land,* 1906; *Alaska, The Great Country,* 1908; *The Takin In of Old Miss Lane,* (This book won the McClure prize of $500.00 for best short story); *The Vanishing Race,* 1912; *The Message of Anne Laura Sweet.* (This book also a prize winner).

HIGGINSON, FRANCIS JOHN (1843), rear-admiral; *b.* Boston, Mass. He served throughout the Civil War after graduating from the U. S. Naval Academy, taking part in leading engagements, including the bombardments at Forts Jackson and St. Philips, the capture of New Orleans, and the battle at Fort Sumter. Naval service afterwards took him all over the world in various squadrons. He became commodore in 1898, when he commanded the *Massachusetts* in the Spanish-American war. The following year he was promoted to rear-admiral, and from 1901 to 1903 commanded the North Atlantic fleet. He retired in 1905.

HIGGINSON, HENRY LEE (1834-1919), banker and philanthropist; *b.* New York City. He was educated at Harvard and showed a strong bent for music, which he later studied in Vienna. The Civil War drew him into the Union army, where he served as a lieutenant-colonel of cavalry. In 1868 he joined the Boston financial house of Lee, Higginson & Co., and became of national note as a banker and philanthropist. He contributed generously to the funds of Harvard University, of whose corporation he was elected a fellow, and also gave large sums for charitable purposes. He was especially notable as a lavish patron of music, and founded and maintained the Boston Symphony Orchestra.

HIGGINSON, THOMAS WENTWORTH (1823-1911) author; *b.* Cambridge, Mass.; *d.* there. He studied for the ministry at the Harvard Divinity School and from 1847 to 1850 was pastor of a Unitarian Church in Newburyport. Between 1852 and 1858 he held another pastorate at Worcester, Mass., then abandoned the ministry to take part in the anti-slavery movement, to which he was devoted. In the Civil War he was colonel of the first regiment of freed slaves and was wounded. After the war he applied his gifts to authorship and became an advocate of educational and political reforms, specially women suffrage. His writings, which comprise many volumes and cover the period of 1863 to 1907, including Young Folks' History of the United States, 1875, which was translated into French and German; Larger History of the United States, 1885; and biographies of Margaret Fuller, Longfellow and Whittier.

HIGH CHURCH. See ENGLAND, CHURCH OF.

HIGH COMMISSION COURT, established by Queen Elizabeth, 1559, dealt with ecclesiastical cases; members were Crown nominees; misused by Laud; abolished, 1689. Similar court in Scotland, 1606-38.

HIGHGATE, a suburb, N. of London, in the co. of Middlesex, about 4½ m.

N.W. of St. Paul's. It is noteworthy as having been the place where Bacon and Coleridge died, and also for its cemetery containing the remains of Lyndhurst, Faraday, and George Eliot, among other celebrities. Whitington's stone is at the foot of H. Hill, and is said to indicate the place at which he turned again after hearing Bow Bells.

HIGHLAND PARK, a city of Michigan, in Wayne co. Its chief industry is the manufacture of automobiles and motors, and the development of this industry has greatly increased its industrial importance within recent years. The population grew from 4,120 in 1910 to 46,099 in 1920.

HIGHLANDS are to be distinguished in formation alike from table-lands and mountains. Generally speaking H. may be said to exist in the E. of the Old World in the E. of Australia, and in the E. of N. America. They occur in broad, expansive masses, unlike high mountains, which are much more localised. Their structure, moreover, is peculiar. Both valleys and watersheds or divides radiate, and the river systems are like great branching trees; the distribution, as in mountainous countries, of parallel ranges separating valleys is only rarely visible—the Appalachians are an exception; as a rule the valleys branch like fingers in the inner H., thus collecting tributary streams, whilst they broaden and deepen as they pass outward. H. are formed by the denudations or washing out of valleys, as, for example, the H. of Scotland, and by slow crustal movements, and sometimes by volcanic activities.

HIGHLANDS, THE, N. amd N. W. district of Scotland. See SCOTLAND.

HIGHNESS, title of honor, used in speaking of or to princess, grand-dukes, and minor royalties. Members of Imperial family addressed as 'Imperial H.'; of Royal family, 'Royal H.'

HIGH PLACE (Hebrew *Bamah*), often means place of worship (originally on hilltops); h. p's were the centre of religious worship among Canaanites; the rites associated with them drew down the fierce denunciations of the prophets; abolished in reformation of Josiah, 621 B.C., but restored later.

HIGH POINT, a city of North Carolina, in Guilford co. It is on the Southern, and the Carolina and Yadkin River railroads. Its industries include the manufacture of furniture, wagons, and silk. It has also railroad car shops. Pop. 1920, 14,302.

HIGH PRESSURE ENGINES. See ENGINES.

HIGH PRIEST. See PRIEST.

HIGH RELIEF, relief work whose degree of projection is half natural circumference.

HIGH SCHOOLS. The high school in the United States has developed as a stepping-stone to enable pupils of the pupil or elementary schools to reach college if they want to continue their education on the higher levels. It has grown on lines that make it a distinctive outgrowth of American education. Generally it provides a four-year course of secondary education. In practice this tuition, added to the eight years primary instruction imparted by the lower schools, suffices in the majority of cases for pupils whom the necessity of earning a livelihood prevents from taking up college studies. In the early days of public education, the academies, which ousted the old Latin grammar schools, served the purpose of high schools. The academies prepared elementary pupils for college, but they were private institutions charging fees that were prohibitive except for students who had parents of means.

The growth of public instruction proceeded for some time without poor elementary pupils having any facilities for continuing their education, either to fit them for practical pursuits or to prepare them for college. The high school came to supply the first-named need and slowly displaced the expensive academies. The latter could not compete with new institutions, which provided a similar secondary education without fees. Private academies survive, but for the most part they are select preparatory schools catering to a restricted class.

The high school did not primarily set out to prepare students for college, but their deposition of the academies left a gap in middle education which the growing educational requirements of the people at large duly called upon the high school to fill. To-day the high school has an extensive curriculum, embracing courses in the classics, literature, languages, arts, sciences, commerce, technology and manual training. In large communities several of these departments, such as the commercial, mechanical and manual training, called for separate buildings, and have developed into important institutions. The high schools have attained such a distinguished place in the country's educational system that they rank with, where they do not eclipse, many seats of higher learning, so much so that they have become known as 'people's colleges'. In 1922 there were

14,000 such institutions. See EDUCATION.

HIGH SEAS, seas over which no individual sovereignty is recognised by international law.

HIGHWAY, public road, which every one has right to use; generally created by legislation or by dedication, but uninterrupted use of any road for certain time may also establish right-of-way. Obligation to repair highway, rests generally with municipalities through which they pass, but may devolve upon owner of land the road passes through.

HILARION, ST. (291-372), abbot; after hermit's life of Egypt, introduced the monastic system into Palestine.

HILARIUS (fl. XII. cent.), mediaeval goliardic poet, possibly of Eng. birth.

HILARY, ST. (*d.* 367), bp. of Poitiers who wrote learned theological books and treatises against Arians; his day is Jan. 13, and has given name Hilary to Eng. legal term between Michaelmas and Easter (these terms were abolished, 1873), and to Lent term at the Univ. Oxford.

HILARY, ST. (*c.* 400-49), bp. of Arles, 429; the dispute as to his episcopal right led to strengthening of papal influence over the Gallican Church; festival, May 5.

HILDA, ST. (614-80), Eng. abbess; took the veil about 647; became abbess of Hartlepool, and subsequently founded 658 Whitby Abbey for monks and nuns; exercised great influence on the religious life of her period.

HILDEBERT OF LAVARDIN, GILDEBERT, ALDEBERT (*c.* 1050-1133), bp. of Le Mans, 1096; adp. of Tours, 1125; noted preacher and theological writer.

HILDEBRAND. See GREGORY VII.

HILDEBRAND, LAY OF, Ger. alliterative poem, (IX. cent.); variant of the Persian story of *Sohrab and Rustum*; a father, long absent from home, returns, and is challenged to single combat by a youth whom he, too late, discovers to be his son.

HILDEGARD, ST. (1098-1179), Ger. religious mystic; became abbess of Disibodenberg (Lorraine), and subsequently founded, 1147, a nunnery near Bingen; famed for prophetic powers.

HILDEN (51° 7′ N., 6° 46′ E.), town, Rhenish Prussia, Germany. Pop. 17,000.

HILDESHEIM (52° 8′ N., 9° 58′ E.); town in Pruss. province of Hanover, at base of Harz Mountains, with fine cathedral (XI. cent.), St. Godehard Church (XII. cent.), St. Michael's; town hall, Carthusian monastery, Knochenhauer-Amtshaus, and many other old houses; chief industries—machinery, vehicles, church bells, bricks, sugar-refining, cigars. A free city of Empire in XIII. cent., H. joined Hanseatic League, 1249; annexed to Prussia, 1866. Pop. 1919, 53,499.

HILDRETH, RICHARD (1807-65), Amer. editor and writer of finance, slavery, etc.

HILL, geographical term for height above a bank and below a mountain.

HILL, AARON (1685-1750), Eng. dramatist and poet; wrote numerous pieces for the stage, of which *Zara*, his chief success, was derived from Voltaire.

HILL, AMBROSE POWELL (1825-1865), Confederate army general; *b.* Culpeper County, Va.; *d.* Petersburg, Va. After graduating at West Point he fought in the Mexican War and against the Seminole Indians in Florida. The outbreak of the Civil War aligned him with the South as a colonel. He took part in the battle of Bull Run; commanded the Confederate right at Antietam; headed a division under Stonewall Jackson at Fredericksburg and Chancellorsville; became lieutenant-general in 1863; when he commanded a corps of the Army of Northern Virginia; led the Confederate center at Gettysburg; and was killed in the attack on Petersburg, Va., while reconnoitering.

HILL, DANIEL HARVEY (1821-1889), Confederate army general and educator; *b.* York District, S. C.; *d.* Charlotte, N. C. He graduated from West Point in 1842 and saw service in the Mexican War. He left the army for a scholastic career, and between 1849 and the outbreak of the Civil War was professor of mathematics and military tactics at Washington College, Va., professor of mathematics at Davidson College, N. C., and president of the North Carolina Military Institute, Charlotte. He joined the Confederate army in the Civil War, and as a lieutenant-colonel commanded a corps at the battle of Chickamauga after taking part in the Peninsula Campaign, as well as in the battles of Beaver Dam Creek, Gaines' Mill, South Mountain and Antietam, and commanding the Richmond and Petersburg defenses in the Gettysburg campaign. In 1865 he surrendered to the Union forces in North Carolina with General J. E. Johnston, under whom he

served in the closing days of the war. Following the peace he founded and edited 'The Land We Love', and became president successively of the Arkansas University and of the Agricultural College at Milledgeville, Ga.

HILL, DAVID BENNETT (1843-1910), U. S. Senator and lawyer; *b.* Havana, N. Y. He studied law and opened a practice at Elmira, N. Y., where he became a leader of the bar. He was active in Democratic state politics as an assemblyman, president of the Democratic State Conventions, mayor of Elmira, lieutenant-governor, and, 1885-91, governor of the State. From 1891 to 1897 he was U. S. Senator from New York and opposed many of President Cleveland's policies. Throughout his public career he projected as an outstanding figure in New York State politics and in 1892 was a leading candidate for the Democratic presidential nomination.

HILL, DAVID JAYNE (1850), American educator and diplomat; *b.* Plainfield, N. J. He graduated from Bucknell University in 1874, became professor of rhetoric in that institution, 1877-79 and president in 1879. In 1888 he was chosen president of Rochester University, resigning his position in 1896 in order to spend three years abroad in the study of diplomacy and international Law. From 1898 to 1903 he was first assistant Secretary of State. He was Minister to Switzerland, 1903-05 to Holland, 1905-08, and Ambassador to Germany, 1908-11. He has served as delegate on various important international bodies, notably the Second Peace Conference at the Hague. His publications include *Principles and Fallacies of Socialism*, 1885; *Genetic Philosophy*, 1893; *The Conception and Realization of Neutrality*, 1902; *World Organization as Affected by the Nature of the Modern State*, 1911; *The People's Government*, 1915; *The Rebuilding of Europe*, 1917; *Present Problems in Foreign Policy*, 1919; *American World Policies*, 1920.

HILL, DAVID SPENCE (1873), University President; *b.* in Nashville, Tenn. Holds degrees from various universities including Randolph-Macon College and State University of Arizona. 1897-1904 instructor at Smith Academy of Washington University, at Ralph Sellew Night Schools, St. Louis, 1901-1904,at Peabody College for Teachers, Nashville, as professor of history and philosophy of education; 1907 and from 1907-1911, professor psychology and education, Professor elect of psychology and education, 1911 at University of Nashville. 1911-1913 at Tulane University of Louisiana professor of psychology and education. At University of Montana, 1913, professor of Summer School. Since August, 1919, president of State University of Wisconsin. Author of *Individual Differences in Children of the Public Schools*, 1913; *An Experimental Study of Delinquent Boys*, 1913; Joint author of *Educational Research in Public Schools*, 1915; *Introduction to Vocational Eeducation*, 1920. Wrote for psychological and educational journals.

HILL, FREDERIC TREVOR (1866), lawyer and author; *b.* Brooklyn, N. Y. He was educated at Yale and Columbia, obtaining the LL. B. degree from the latter university in 1899. He joined the army in the World War, served on General Pershing's staff and was promoted to colonel. France made him a chevalier of the Legion of Honor. His publications include a number of novels, among them *The Thirteenth Juror*, 1913, collections of short stories, and several works on legal subjects. He wrote also on the lives of Washington, Lincoln, Grant and Lee, and, 1920, a book on aeroplane construction.

HILL, GEORGE BIRKBECK NORMAN (1835-1903), Eng. writer, especially noted for editions of Dr. Johnson's works.

HILL, GEORGE WILLIAM (1838-1914), astronomer; *b.* New York City. Graduating from Rutgers College in 1859, he joined later the staff of the American Ephemeris and Nautical Almanac, of which he became editor. He made notable researches into celestial mechanics, wrote largely on that subject and on mathematics, and threw light on the lunar theory, for which he received the gold medal of the Royal Astronomical Society of London, in 1887. He received also the Damoiscan Prize of the Academy of Sciences of Paris, 1898 and the Copley Medal, 1909. His most distinctive work is *A New Theory of Jupiter and Saturn*, 1890.

HILL, JAMES (JEROME), (1838-1916), American railroad developer and financier; *b.* near Guelph, Ontario, Canada. His early educational opportunities were limited, and he entered business life at the age of 15, settling in St. Paul, Minn., and working as clerk and agent in the Mississippi River steamboat business from 1856 to 1868. In 1870 he established the Red River Transportation Company, doing business between St. Paul and Winnipeg. The purchase in 1878, in company with others, of the defaulted bonds of the St. Paul and Pacific Railroad Company, marked hi

entrance into the railroad business, in which he became one of the most powerful and remarkable figures on the American continent. He concentrated all his tremendous energy on the development and perfecting of the great system that, by a series of consolidations, became the Great Northern Company, which not only included a railroad to the Pacific Coast, but also embraced a line of steamers running to China and Japan. He was also a great factor in the building of the Canadian Pacific. The country owes him a debt of gratitude for his contribution to the development and prosperity of the Northwest. He resigned from the presidency of the system in 1907 to become chairman of the board of directors, which office he relinquished in 1912. Apart from his business interests, he took a keen and active interest in art, literature and civic betterment.

HILL, LOUIS WARREN (1872), Railway Chairman; *b.* in Minnesota. Bachelor of Philosophy of Yale College in 1893. Held positions on railroads of which his father was president. President of Great Northern Railway since 1907.

HILL, ROWLAND (1744-1833), famous Eng. preacher.

HILL, ROWLAND, VISCOUNT (1772-1842), a British general, nephew of the preacher Rowland Hill, was *b.* at Prees Hall, near Hawkstone. He commanded the 90th regiment in Abercromby's Egyptian Expedition, 1801, and served throughout the Peninsular War as Sir Arthur Wellesley's ablest coadjutor. He captured the forts of Almarez, for which he was created Baron, 1814. He distinguished himself by his brigade charge at Waterloo, and succeeded Wellington in 1828 as commander-in-chief.

HILL TIPPERA, TRIPURA (23° 30′ N., 91° 40′ E.), native state, adjoining Bengal, India; area, 4,086 sq. miles; rice, cotton. Pop. 230,000.

HILLARD, GEORGE STILLMAN (1808-1879), lawyer and author; *b.* Machias, Maine; *d.* Boston. He graduated from Harvard Law School in 1832 and established an extensive practice at Boston, at the same time taking part in politics as a state assemblyman, in editing the Christian Register, and the Jurist, and in the editorial conduct of the Boston Courier, in which he acquired an interest. From 1866 to 1870 he was United States district attorney for Massachusetts. He edited the works of Edmund Spenser and his voluminous writings include a biography of General George B. McClellan.

HILLEL, called *Hazaken* ('the elder') and *Hababli* ('the Babylonian') (*c.* 75 B.C.-10 A.D.), a Jewish rabbi, was a native of Babylon. When he was already verging towards old age, he began to study law under Shemaien and Abtalion in Jerusalem, and soon grew famous for his profound lore, whereby, according to the Talmud, he comprehended all tongues, even those of trees and beasts. Being well-nigh penniless, his learning was only acquired by exceptional zeal and self-denial. It is unlikely that he was ever president of the Sanhedrin, yet his humility and loving-kindness, and what has been described as the 'sweetness and light' of his personality, ensured the popularity of his teaching, which, like that of Jesus, was ever averse from 'sacerdotal traditionalism' and blind adherence to legal ordinance.

HILLER, FERDINAND (1811-85), a musical composer, played a concerto of Mozart at the age of ten, and in 1827 was present at the deathbed of Beethoven. *B.* at Frankfort-on-Main, he visited Weimar, Vienna (with Hummel, his master), Paris (where he lived from 1828-35), Italy, St. Petersburg, and England, etc. From 1850 till his death, he was municipal capellmeister at Cologne. His numerous compositions include chamber, orchestral, and vocal music; these display conspicuous inequalities, but since its first publication, his oratorio entitled *Die Zerstorung Jerusalems*, 1839, has been recognised as a masterpiece.

HILLES, CHARLES DEWEY (1867), Republican organizer and insurance manager; *b.* Belmont County, Ohio. After a high school and academy education he engaged in institutional work between 1890 and 1909 as superintendent of the Boys' Industrial School of Ohio and of the New York Juvenile Asylum at Dobbs' Ferry. In 1909 he entered the government service as assistant secretary of the Treasury and in 1911 became secretary to President Taft for the remainder of the latter's term of office. While occupying that post he was chosen chairman of the Republican National Committee and as such took a prominent part in the Taft presidential campaign 1912. The following year he entered business as a member of the firm of Dwight and Hilles, New York City, resident managers of the Employers Liability Insurance Corporation. He retained a close association with the Republican organization and in 1922 was chosen chairman of the National Republican Club.

HILLIARD, NICHOLAS (*c.* 1537-1619), Eng. craftsman and miniature painter, whose works are the treasures of

collectors. His *s.* Lawrence (*d.* 1640) excelled him in the same field.

HILLIARD, ROBERT COCHRAN (1857), Actor, *b.* in New York; started professional career in his own theatre, The Criterion, Brooklyn in *False Shame*, 1886. Has taken leading parts in *Mr. Barnes of New York*; Richard Gray in *Adrift* which he wrote. Recently he played part of John Earl of Woodstock in *Sporting Life*. He was also half owner of this play. Starred in *The Sleepwalker*, *The Mummy*. In 1905 created role of Dick Johnson in *The Girl of the Golden West*. Played in *The Pride of Race*, *The Argyle Case*, and *The Littlest Girl* (written by himself). Starred with Paul Arthur in *The Nominee*.

HILLIS, NEWELL DWIGHT (1858), Congregational minister and author; *b.* Magnolia, Iowa. He graduated from McCormick Theological Seminary, in 1877, when he entered the Presbyterian ministry, filling pulpits of that denomination at Peoria and Evansville, Ill. until 1894. The following year he became pastor of an independent congregation forming the Central Church, Chicago, and in 1899 of Plymouth Congregational Church, Brooklyn, N. Y. He acquired considerable note as a preacher, lecturer and author. His publications have a stimulating and constructive note and bear upon the problems of modern life. He edited the lectures and sermons of Henry Ward Beecher, with whom and Phillips Brooks he became ranked as a preacher.

HILLSBORO, a city of Texas, in Hill co., of which it is the county seat. It is on the Missouri, Kansas and Texas, the St. Louis Southwestern and the Trinity and Brazos Valley railroads. It is the center of an extensive agricultural region. Its industries include flour mills, planing mills, and hay press works. Pop. 1920, 6,952.

HILLSDALE, a city of Michigan, in Hillsdale co., of which it is the county seat. It is on the Michigan Southern and Lake Shore Railroad. It is the manufacturing and commercial center of the county. Its industries include screen factories and aluminum works. It is the seat of Hillsdale College. It has parks and several handsome public buildings. Pop. 1920, 5,476.

HILPRECHT, HERMAN VOLRATH (1859), German-American Assyriologist; *b.* Hohenerxleben, Germany. He came to the United States in 1886 after studying at Bernburg and Leipzig, and edited the Oriental department of the *Sunday-School Times*, published at Philadelphia. He was also research professor of Assyrian and of Semitic philosophy at the University of Pennsylvania for twenty-five years, 1886-1911 and meantime made archaeological explorations in Asiatic Turkey. He headed the University's various expeditions to Nippur, an ancient city of Babylonia between 1888 and 1914, and became an acknowledged authority on cuneiform paleography. The Babylonian section of the Imperial Ottoman Museum at Constantinople was reorganized by him between 1893 and 1909. Foreign governments conferred many orders upon him and he received several medals as well as honorary membership of foreign learned societies. His publications relate chiefly to his Assyrian researches and include valuable works on the Nippur excavations and on old Babylon. He was editor-in-chief of the University of Pennsylvania's *Bulletins* of the Babylon expeditions.

HILLSDALE COLLEGE, a coeducational institution situated at Hillsdale, Mich., founded in 1855 by the Free Baptists. Its curriculum is modern and embraces commerce, home economics, music, elocution and fine arts. The classics and sciences receive special attention. In 1922 there were 468 students and 24 teachers under the direction of J. W. Mauck. The institution was originally known as the Michigan Central College, opened at Spring Harbor, Mich. in 1844, and afterwards removed to Hillsdale.

HILO, a seaport, and the tn. second in importance of the Sandwich Is., picturesquely situated on the E. coast of the island of Hawaii. It exports sugar, molasses, arrowroot, and rice. Pop. 6,745.

HILTON, JOHN (1804-78), Eng. surgeon; surgeon to Guy's Hospital, London; pres. of Royal Coll. of Surgeons, 1867.

HILVERSUM (52° 13′ N., 5° 11′ E.), town, N. Holland. Pop. 35,000.

HIMALAYA (*c.* 31° to 34° 50′ N., 70° 30′ to 96° E.), the highest system of mountains in the world, stretching, in an irregular curve, almost 1500 miles along the N. boundary of India; with a varying breadth of 100 to 160 miles, they divide India from Tibet, and lie roughly between the Indus and the Brahmaputra. The H. consist of several ranges of peaks, separated by deep gorges through which rivers flow. Rising steeply from the plain of the Ganges stands a range (some 4000-5000 ft.), between which and the higher ranges lie the beautiful and fertile valleys of Nepal and Bhutan. The greater system, starting from the Pamir Plateau in the extreme N.W., is divided into

two main parallel chains, one lying N. of the other. The N. chain, forming a watershed between India and Tibet, has been little explored; its only point under 16,000 ft. is called Drass Pass (*c.* 11,300 ft.), which leads to Kashmir; and the Niti Pass (*c.* 16,700 ft.) connects India with E. Turkestan. The S. chain, consisting of lofty snowclad peaks, includes many of the highest mountains in the world—many rising over 20,000 ft.; the highest, Mt. Everest (28,000 ft.), is the loftiest peak known in the world; other peaks are K2 or Godwin-Austen (*c.* 18,260 ft.); Kinchinjunga (*c.* 28,150ft.); Dhawalagiri (*c.* 26,280 ft.); Nanda-Devi (*c.* 25,700 ft.); Trisul (*c.* 23,400 ft.). From this chain flow the Ganges, Indus, Brahmaputra, and many other rivers; on its slopes also stand many sanatoria—Simla, Darjiling, Almora, etc.—which are taken advantage of during the hot seasons.

There are few lakes; but in E. are Yamdok-cho and Chomto-dong; in W. lie the holy Tibetan lakes of Manasarowar and Rakas Tal (whence flows the Sutlej River), and also Lake Kashmir. There are numerous glaciers, and the snow-line is higher on the Indian side than on the Tibetan; metal ores exist and gold is worked in Tibet. On the Indian side, most of the inhabitants are Hindus, the Tibetans being mostly of Turanian stock. See EVEREST, MOUNT.

HIMERA (37° 58′ N., 13° 40′ E.), ancient town, Sicily, modern Thermae Himeraeae; ruined by Hannibal, 409 B.C.

HIMERIUS (315-86), Gk. philosopher; studied at Athens, wrote many speeches; his writings suffer from the over-elaboration fashionable in his day.

HINCKLEY (52° 33′ N., 1° 23′ W.), town, Leicestershire, England. Pop. 13,000.

HINCMAR (*c.* 805-82), abp. of Reims, came to court of Louis the Pious, 844; abp., 845; had heresy of Gottschalk condemned; attacked Lothair II. of Lorraine for divorcing his queen; had various conflicts with other ecclesiastics and with Pop John VIII. over his metropolitan rights; wrote life of *St. Remigius*.

HINDENBURG, PAUL VON (1847*B*, German soldier; *b.* Posen, E. Prussia; educated in typical Junker atmosphere; served as lieutenant in the Austrian campaign, 1866; and decorated for valor in his first battle. In Franco-German War present at St. Privat, Sedan, and siege of Paris. Subsequently transferred to general staff, 1878; specialized on topography of E. Prussia, and acquired an unrivalled knowledge of its strategical features; strongly opposed the scheme for draining the region, conceiving that its swamps and lakes formed defensive zone. After commanding the two E. Prussian army corps at Königsberg and Allenstein, retired, 1911. On Aug. 22, 1914, when Russian invasion of E. Prussia reached its high-water mark, he was appointed to the command of an army for the reconquest of the country, with Ludendorff as chief of staff. In a week he had effected a complete change in the situation. At the battle of Tannenberg or Osterode (Aug. 26-31), by a bold and hazardous strategy, he won a complete and decisive victory. At once he became a popular idol, and on Sept. 25 was given the rank of field-marshal, and placed in chief command of the Austro-German forces on entire Eastern front. In Jan. 1915 he struck in the direction of Warsaw, and twice subsequently attempted to take the city, but failed. It was occupied in May, 1915, and the Russians were driven back to the Pripet marshes, but no military decision was reached. His spectacular advances gave frenzied delight to the Ger. people; honors were showered upon him, and it was accounted a pious act to drive nails of homage into his wooden effigy in Berlin. The square-headed, heavy-jawed Prussian became a subject of legend and an object of worship. In Aug. 1916 he was appointed chief of the general staff in succession to Falkenhayn, whose plans at Verdun and in the Trentino had failed. He brought with him his faithful lieutenant, Ludendorff. Nothing, however, was accomplished in the West, and the Somme battles forced the Germans to retreat to the much-vaunted 'Hindenburg Line,' which was to be the *ne plus ultra* of Allied advance. On Oct. 3 he embodied the views of G.H.Q. in a statement advising that the war should be brought to a close. After the Armistice he retained his chief command until June, 1919. In the following July he wrote to Marshal Foch offering himself as a sacrifice for the ex-Kaiser. In Nov. he gave evidence as to the responsibility for the war before the Reichstag Committee. More than once he intervened as the defender of Ludendorff, who had incurred marked unpopularity. His work, *Out of My Life*, appeared in April, 1920, his argument being that at the end of 1916 Ger. military fortunes were almost at their lowest ebb, and he and Ludendorff were called in too late to repair the mistakes that had been made; he considers that Germany lost the war, not by the enemy's skill and bravery, but by the outbreak of revolution at home, due to the failure of the political rulers. In 1923 he made speeches in which he

favored the restoration of the monarchy. See WORLD WAR.

HINDI, EASTERN AND WESTERN, Indo-Aryan tongues of district of India lying E. of the Punjab; Hindustani arose out of W. H. dialect.

HINDLEY (53° 32′ N., 2° 34′ W.), town, Lancashire, England. Pop. 1911, 25,000.

HINDU KUSH (35° 50′ N., 70° 30′ E.), range of mountains in Central Asia, stretching from Pamirs to Koh-i-Baba Mts. at Bamian Pass, *c.* 500 miles long; forms S. boundary of Afghanistan, and for some distance separates Badakhshan from Kafiristan and divides Kabul and Oxus basins. Contains sources of many important rivers; mts. crossed by many passes, most important being Khawak, leading from Badakhshan to Charikar and Kabul; Dorah, conducting to Chitral valley from Oxus; Barroghil, leading from Chitral and Kashmir to Upper Oxus and Yarkand; Lowarai, between valleys of Panjkora and Chitral.

HINDUISM, the name used for the religion of more than two hundred millions of the peoples of India. Hindus do not form one ecclesiastical organization, nor do they all hold one creed. Yet this congeries of peoples is more or less loosely united by certain principles which are common to them all: (1) a rigid and elaborate *caste* system—so different from anything in Western religion; (2) a pessimistic view of life which makes it something on the whole evil, and is involved with the specially Oriental doctrine of reincarnation. The origin of H. dates back to before 1000 B.C., when the Aryan tribes invading from the N. were conquering the Dravidians of India. There was some intermingling of conquerors and conquered, but not enough to prevent a rigid caste system; the conquered people were secluded not only from social but from religious privileges. The primitive Vedic religion of the Aryan conquerors had many gods, but no elaborate worship. By about 800 B.C. the class of priests was developing into the Brahman caste. Four castes were evolved—the *Brahmans*, *Kshatriyas* (warriors), *Vaisyas* (traders), and *Sudras* (serfs). Not only does caste involve something of what we mean by 'class distinctions,' but a Brahman might not eat food prepared by any one but a Brahman. Certain trades became hereditary in certain castes, and those born into them had to remain at them. At the same time ritual became much more elaborate, and Brahmanism as a religion tended to be crushed under a weight of ritual.

HINDUR, NALAGARH (31° 6′ N., 76° 40′ E.), state, Punjab, India. Area, 2505 sq. miles. Pop. 52,551.

HINDUSTAN, OR HINDOSTAN, means the 'country of the Hindus.' The Persians used to call the R. Sindhu 'Hindhu,' and that part of the district was therefore called H. The region denoted was gradually extended, until the whole tract of country between the Himalaya Mts. and the Vindhya Mts., W. of Bengal, was so designated. In many instances even H. was used as a synonym for India, but in this sense it is not now used, and in a more restricted sense is less often employed.

HINDUSTANI. See INDIA.

HINES, WALKER DOWNER (1870), laywer; *b.* at Russelville, Ky. Bachelor of Science of Ogden College, 1888, and in 1893, Bachelor of Laws of University of Virginia. Has been assistant attorney, assistant chief attorney, and first vice-president from 1893-1904 of Louisville and Nashville Railroads. 1904-1906 member of law firm in Louisville, Ky. 1906-1918 general counsel of Atchison, Topeka and Sante Fé Railway, 1916-1918 chairman of board of directors. Chairman of the executive committee 1908-1916 Director general of railroads, 1919-1920. Law practise in New York since October, 1921.

HINGANGHAT (20° 33′ N., 78° 53′ E.), town, Central Provinces, India. Pop. 12,662.

HINGHAM, a town of Massachusetts, in Plymouth co. It is on the New York, New Haven and Hartford Railroad, and on Massachusetts Bay. It has steamship connection with New York and is a favorite summer resort. It has great historical interest and contains the oldest 'meeting house' in New England, which was first occupied in 1682. It is the seat of Derby Academy. It has a high school and a public library. The fishing interests are important.

HINTERLAND, Ger. name for tract beyond district occupied by a colony, but claimed by the colony as territory which they will require for expansion.

HIOGO, HYOGO (34° 48′ N., 135° 14′ E.), town, Japan; has colossal statue of Buddha and temples; shipbuilding; textile manufactures. Pop. *c.* 300,000.

HIONG-NU, people who had a vast empire N. of China in the Early Christian era; possibly Turks.

HIP, part of the human body called the haunch in cattle, being connection of legs and body; architectural term for

meeting-place of sloping sides of roof, the finial on which is called the Hip-knob.

HIP-JOINT DISEASE. See JOINT. TUBERCULOSIS.

HIPPARCHUS (190-120 B.C.), Gk. astronomer; invented trigonometry; discovered precession of equinoxes; measured sun's distance from earth.

HIPPEASTRUM, a genus of plants, natural order *Amaryllidaceoe.* It comprises fifty species of showy tropical bulbous plants with funnel-shaped flowers.

HIPPIAS OF ELIS (V. cent. B.C.), Gk. sophist, a rival of Protagoras; figures in Plato's *Hippias major* and *minor.*

HIPPOCRAS, old medicinal cordial composed of wine mixed with sugar and cinnamon, ginger, or other spices, and strained.

HIPPOCRATES (V. cent. B.C.), Gk. philosopher and physician; a descendant of Æsculapius; *b.* at Cos, 460 B.C.; called 'Father of Medicine,' and first to treat it scientifically; a firm believer in recuperative force of nature, which he endeavored to stimulate and direct; wrote *Prognostics, Epidemics, Aphorisms.*

HIPPOCRENE (Gk. *hippou krene,* spring of the horse), fountain on Helicon supposed to have been formed by stroke of Pegasus's hoof; sacred to the Muses and source of inspiration to poets.

HIPPODAMUS OF MILETUS (fl. V. cent. B.C.), Gk. architect employed by Pericles at Athens.

HIPPODROME (Gk. *hippos,* horse; *dromos,* racecourse), Gk. racecourse, oblong, with semicircular end. The name is given to a famous place of entertainment in New York City.

HIPPOLYTA (classical myth.), queen of Amazons; slain by Hercules; another version makes her marry Theseus, who conquered her forces in Attica.

HIPPOLYTUS (*b.* II. cent.), presbyter of Rom. Church under bp. Zephyrinus; quarrelled with Calixtus I.; martyred in persecution, *c.* 235; wrote numerous works, but all attributed to him are probably not his; some exist in translations only.

HIPPOLYTUS (classical myth.), *s.* of Theseus, king of Athens, by Antiope or Hippolyta, the Amazon queen. His stepmother, Phaedra, conceived a passion for him, but, her advances being rejected, she accused him to her husband of having violated her chastity. Theseus laid a curse upon him, and he met with a violent end; but was restored to life by Æsculapius.

HIPPOLYTUS, CANONS OF, a work preserved only in an Arabic trans. of a Coptic trans. of the original Gk., written in the name of H., and dealing with Church order, ordination, sacraments, prayer, almsgiving, etc.; date and authorship are uncertain, but it probably appeared in Egypt in the IV. cent. Its exact connection with the *Egyptian Church Order, Apostolic Constitutions,* and *Testament of the Lord,* with which it undoubtedly has some relation, is a complicated literary problem. Probably the canons and the Egyptian Order are derived from the same source.

HIPPONAX (VI. cent. B.C.), Gk. satirical poet; inventor of parody and the choliambus metre.

HIPPOPOTAMUS (Gk. for river-horse), the sole member of a family of artiodactyle ungulate mammals. Today it is found only in Africa, but fossils of a larger breed of hippopotami have been found in England, the rest of Europe, and in India, etc. The common species, *H. amphibius,* inhabits rivers in all parts of Africa, but the smaller, *H. liberiensis,* is restricted to the W. of that continent. In size of H. is only a little inferior to the elephant; its legs are very stunted, so that its belly touches the ground when it walks on mud or other yielding surfaces; there is often as much as 2 in. of skin on the back and flanks, but no hair covers its dark brown hide; its small eyes are set high in the huge, ungainly head with its great snout and enormous rounded muzzle; the tail is quite short, and on each foot there are four even and hoofed toes. The animal is aquatic, nocturnal, and voracious. It is a good swimmer and diver, and as its respiration is slow, it can stay a long while under water. By day it is sleepy and languid, but by night it often comes out of the water to graze on the banks, or if it lives in a cultivated region, it will make substantial inroads into crops and cause terrible destruction. It is this bad habit which accounts for its disappearance from the fertile plains of the lower Nile. It is gregarious by nature and usually playful and good-tempered, but persistent pursuit often provokes a dangerous passion. When angered it emits a loud and piercing noise, which has been likened to the grating sound of a creaking door. Hunters chase it in a variety of ways, sometimes it is ensnared in pits, sometimes it is shot, harpooned, or pierced with spears from a canoe. The teeth are valuable as ivory, the tongue, the

fat, and the jelly from the feet are favorite articles of diet, whilst the hides find many markets.

HIRA (32° N., 44° E.), ruined Arab city, formerly capital of a kingdom on the Persian Gulf.

HIRADO (33° 16′ N., 129° 36′ E.), mountainous island, lying off W. coast of Japan.

HIRAM COLLEGE, a co-educational establishment situated in Hiram, Ohio, originally known as the Eclectic Institute, founded by the Christian Church in 1850. It was incorporated as a college in 1870. It has women's dormitories, laboratories, a museum and a gymnasium. In 1922 there were 325 students and 24 teachers under the direction of M. L. Bates.

HIROSAKI (40° 35′ N., 140° 30′ E.), town, Nippon, Japan. Pop. 40,000.

HIROSHIGE, adopted name of three Japanese artists of XIX. cent. whose prints are much valued. See ARTHUR MORRISON'S *The Painters of Japan*.

HIROSHIMA (34° 21′ N., 132° 33′ E.), port, Nippon, Japan. Pop. 142,763.

HIRSAU (48° 43′ N., 8° 43′ E.), village, Württemberg, Germany; formerly site of celebrated Benedictine monastery, of which beautiful ruins remain. Pop. *c.* 800.

HIRSCH, MAURICE DE, BARON (1831-96), Jewish capitalist and philanthropist; devoted much time and money to schemes for bettering condition of Jews; endowed the *Alliance Israelite Universelle*, 1889; gave $2,500,000 for establishment of schools in Galicia and Bukowina; founded Jewish Colonisation Association, to benefit persecuted Jews.

HIRSCHBERG, a town 1120 ft. above the sea-level, 43 m. S.E. of Görlitz, and connected by rail with Glatz, Schmiedeberg and Grünthal, in Silesia, Prussia. Situated at the meeting of the Bober and Zacken rivers, it is especially noted for its beautiful surroundings, but its commerce is both varied and considerable. Pop. 20,560.

HISGEN, THOMAS LEWIS (1852) an American manufacturer and politician, *b.* in Petersburg, Ind. For many years he was engaged in the oil business and opposed the Standard Oil Company. In 1908 he was candidate of the Independent party for president of the United States.

HISPELLUM, Ital. colony founded by Augustus; called Flavia Constans by Constantine; now *Spello*; important ruins.

HISSAR (38° N., 69° E.), district, Central Asia, between Oxus on S. and Hissar Mts. on N. Chief towns, Hissar and Kabadian. Soil fertile; rice and flax main products; towns celebrated for damascened swords and silks. Pop. 10,000.

HISSAR (29° 9′ N., 75° 44′ E.), capital, H. district, Punjab, India; horse and cattle fairs. Pop. 17,647. H. district has area *c.* 5000 miles. Pop. 785,000.

HISTLÆUS (*d.* 494 B.C.), tyrant of Miletus, who at first Medised, but afterwards led the fruitless Ionian revolt against Darius; was captured and crucified.

HISTOLOGY, the study of microscopic physiology, dealing with cells and tissues of living things. See CELL, CYTOLOGY.

HISTORICAL SOCIETY, AMERICAN. An association of students and historical writers founded at Saratoga, New York, in September, 1884 with 50 members. now 2,500. The society aims to promote and encourage historical investigation, and its many publications cover a wide field historical study. The American Society of Church History merged with it in 1896 as the Church History section, but in 1904 separated and became an independent body again. Among the principal committees are those on Historical Manuscripts and Public Archives. Annual meetings are held, and annual reports are issued through the Smithsonian Institute. Among the Society's important publications are reprints of *Original Narratives of American History* (20 vols.); *The Study of History in Schools*, etc. The official organ of the society is The American Historical Review, a quarterly.

HISTORY is both the biography and unwritten events of the life of the human race. The beginnings of history are to be seen in the rude weapons, bones, and barrows left by what used to be called 'prehistoric' man. It is impossible to decide how far back into this early period the myths and sagas go, and how far these are inventions, how far glorifications of actual events. Niebuhr's *Romische Geschichte* 1812-32, first turned attention to their possibly historical nature, and much history has since been read into the story of Romulus and myths in general. The reverse of the process which turned heroes into supernatural beings is also seen: the Wade, who is a hero of some parts of the Eng. countryside, and is treated by Scott and others as a mediaeval personage, is possibly Woden. The point is that

history, even in the old-fashioned sense, may begin with Eolithic man.

Before the first Egyptian dynasty, dated by Mariette from 5004 B.C., there is a tradition of nearly 20,000 years of rule of gods, demi-gods, and shades. With the Memphite dynasties (*c.* 4000 B.C.) Egyptian monumental history begins, and papyri, our first-written records, are found in the tombs. Inscriptions were for long the only history; among them are the cuneiform writings of Assyria, perhaps contemporary with first Egyptian papyri; they recorded important events, names of rulers, etc.; similar but fuller accounts (*Annales*) of events of the years were afterwards kept by the Romans. The Greeks never cleared their early history from its encumbrance of myth. though sceptics arose like Hecataeus of Miletus (6th cent. B.C.), and in Greece itself in age of Pericles; but Thucydides, Xenophon, and afterwards Polybius definitely set before themselves the ideal of historical veracity.

History through Gr. example has, from Roman times to the present day, been taken to be an account of events truthfully but elegantly narrated; sometimes accuracy has impinged on elegance, sometimes everything is sacrificed to the love of literary effect; sometimes scrupulous intention of accuracy is to be found in masterpieces of style, as in Thucydides, Tacitus, Brantôme, Gibbon, Macaulay, and, as many people now think, Froude. The acceptance of Christianity had as enormous an effect on historical perspective and on the growth of the spirit of historical citicism as it had on history, and a similar remark may be made about the Reformation. Discussion of questions, still unsettled, as to usages of early church trained men's minds to consider historical evidence, and from that time critical attention has been given to the past. The Fr. house of St. Maur started, in 17th cent., the work of editing texts which is now being unintermittently carried out by Record Commissions and private initiative in every modern country. The importance of the research element in modern history writing has led to system of specialists on minute points. The bibliography of history is a wide subject in itself.

HISTORY, ANCIENT. See ANCIENT HISTORY.

HIT (33° 39′ N., 42° 50′ E.), town, Turkey-in-Asia; produces naphtha, bitumen. Pop. *c.* 5000.

HITA, GINÉS PEREZ DE (*c.* 1540-*c.* 1604), Span. author; wrote well-known romance, *Guerras civiles de Granada.*

HITCHCOCK, CHARLES HENRY (1836-1890), geologist; *b.* Amherst, Mass. After his graduation from Amherst College in 1856, he became assistant State geologist of Vermont, 1857-61; State geologist of Maine, 1861-2; and of New Hampshire, 1868-78. From 1868 to 1908 he served as professor of geology at Dartmouth College. He compiled many geological maps and was a founder of the Geological Society of America.

HITCHCOCK, ETHAN ALLEN (1798-1870), major-general; *b.* Vergennes, Vt.; *d.* Sparta, Ga.; *g.s.* of Ethan Allen. He entered the artillery in 1817 as a third lieutenant upon graduating from West Point and commanded the corps of cadets from 1829 to 1833. He saw service in Florida against the Indians and in the war in Mexico, when he reached the ranks of colonel and brigadier-general. After retiring from the army he was gazetted major general of volunteers. He was interested in alchemy, Swedenborg and Dante, and published works on these subjects.

HITCHCOCK, ETHAN ALLEN (1835-1909), U. S. ambassador; *b.* Mobile, Ala.; *d.* Washington, D. C. After engaging in business in St. Louis, Mo., and in China, and serving later as president of a number of manufacturing, mining and railway companies, he was appointed by President McKinley as envoy to Russia, 1897. The Russian legation being raised to an embassy the following year, he became the first American Ambassador to the Czar's court, but soon returned to the United States to join the Cabinet as Secretary of the Interior, a post he held through the McKinley and Roosevelt administrations till 1907.

HITCHCOCK, FRANK HARRIS (1867), lawyer; *b.* Amherst, O. He graduated from Harvard in 1891 and proceeded to study law in Washington, D.C., where he was admitted to the bar three years later. Entering the government service, he became chief of the foreign markets division of the Department of Agriculture, chief clerk of the Department of Commerce and Labor, first assistant Postmaster General, and 1909-13, Postmaster General. During his direction of the Post Office the parcel post and postal savings banks were established. In 1908 he was chairman of the National Republican Committee and managed the Taft presidential campaign of that year; also the campaign for the nomination of Charles E. Hughes for President in 1916. In 1913 he resumed the practice of law in New York City.

HITCHCOCK, GILBERT MONELL (1859), statesman and publisher; *b.* Omaha, Neb. He received his education in his native city and in Baden-Baden, Germany, later studying law and obtaining the LL.B. degree of the University of Michigan. He practised in Omaha from 1881 to 1885, when he entered journalism by establishing the Omaha Evening World. Acquiring the Omaha Morning Herald in 1889, he combined the two journals as the World-Herald and became notable as its publisher. He served three terms in the lower house of Congress between 1903 and 1911 as a Democrat, and in the latter year was elected to the Senate, where he remained until 1923, having been defeated for re-election. After the World War he was Preisdent Wilson's chief spokesman during the heated debates on the League of Nations (*q.v.*) in the Senate in a vain effort to obtain the assent of the Republican majority of that chamber to American participation in the League's functions.

HITCHCOCK, ROSWELL DWIGHT (1817-1887), theologian; *b.* East Machias, Me.; *d.* Somerset, Mass. He graduated from the Amherst Theological Seminary in 1848, and later studied in Halle and Berlin. After serving as pastor of an Exeter (N.H.) Congregational Church, 1845-52, he became professor of revealed religion at Bowdoin College and 1855, professor of church history at the Union Theological Seminary, of which institution he was appointed president in 1880. He was an editor of the American Theological Review and wrote an analysis of the Bible.

HITTITES. The origin of the race is uncertain; described as living at Hebron; mentioned among the founders of Jerusalem; spoken of as a northern people, and as also inhabiting the *s.* They probably came from Cappadocia and poured into Palestine, where to a large extent they lost their racial individuality by intermarriage with Semitic people and by adopting the Babylonian religion and customs. They are frequently referred to in O.T., and their relations with the Hebrews were friendly. The Egyptian and Assyrian monuments and the cuneiform inscriptions of Van in Armenia have yielded much information; excavations at several centres in Asia Minor, the Tell-el-Amarna letters, and the archives of the Hatti kings have also proved invaluable aids to the study of the race.

HIVITES, people of Palestine mentioned in the Bible; expelled by the Jews (*Exodus* 3$_8$).

HLOTHHERE, king of Kent (673-85); slain in battle by his nephew Eadric.

HOACTZIN, OR HOATZIN (*Opisthocomus hoazin*), an interesting S. American bird, smaller than a pheasant olive colored, varied with white, with yellow crest. The young have a remarkable habit of climbing by means of claws on each wing. Anatomically peculiar, it is probably a survival of a primitive type.

HOADLY, BENJAMIN (1676-1761), Eng. bp., author of controversial works on relation of Church and State; himself latitudinarian, he hotly disputed with High Churchmen; successively bp. of Bangor, Hereford, Salisbury, and Winchester; in 1717 preached before king sermon on kingdom of Christ, the power of the Church, which gave rise to *Bangorian Controversy.*

HOANG HO, HWANG HO, YELLOW RIVER (37° 30′ N., 118° 29′ E.), one of the principal rivers of China; rjses in the mountains of Tibet, and flowing N.E. traverses N.W. part of China and part of Mongolia; re-enters China, flowing S., E., and N.E.; enters Gulf of Pechi-li; length, 2500 miles; liable to floods.

HOAR, EBENEZER ROCKWOOD (1816-1895), jurist and U. S. Attorney General; *b.* Concord, Mass.; *d.* there; *b.* of George Frisbie Hoar (*q.v.*). He graduated from Harvard in 1838 and later practised law. In 1849 he became judge of the Massachusetts Court of Common Pleas and judge of the State Supreme Court ten years later. He joined the national administration in 1869 as Attorney General. In 1873-75 he served on the Joint High Commission that framed the Treaty of Washington.

HOAR, GEORGE FRISBIE (1826-1904), U. S. Senator and lawyer; *b.* Concord, Mass.; *d.* Worcester, Mass. He studied law at Harvard, after graduating from that university in 1846 and practised in Worcester, Mass. Drawn into politics, he early became identified with the Free Soil party as a Republican. Between 1852 and 1857 he served in the Massachusetts legislature as assemblyman and senator, and in 1860 was city solicitor. In 1869 began his long service of 35 years in the national legislature. He served in the House of Representatives as a member for Massachuetts during four successive Congresses and in 1877 was elected to the Senate, retaining membership of that body till his death. He was a leading figure at a number of National Republican Conventions and served on the Electoral Commission which decided the Hayes-Tilden presidential contest in 1876. As

a strong anti-imperialist, he stoutly opposed McKinley's policy in the Philippines. He challenged the right of the United States to retain the islands and demanded that they be returned to the Filipinos and protected from foreign interference. His scholarship was wide and embraced the sciences, classics, history and archaeology. In 1903 appeared his Autobiography of Seventy Years.

HOBART (42° 56′ S., 147° 21′ E.), capital, Tasmania; fine harbor; has two cathedrals, Parliament Houses, Government House; iron foundries, breweries. Pop. 1921, 52,163.

HOBART, GARRET AUGUSTUS (1844-99), American lawyer and vice-president; *b.* Long Branch, N. J. He graduated at Rutgers College in 1863, and three years later was admitted to the bar. He settled at Paterson, N. J., where he built up a large practice. He held a number of local offices and served in the State Assembly (1873-78) and the State Senate 1879-85. He soon became nationally known, and in 1896 was elected vice-president of the United States on the ticket with President McKinley. His judgment was mature, his views conservative, and he was a figure of pronounced importance in Republican councils.

HOBART, GEORGE VERE (1867), author, playwright; *b.* at Cape Breton, Nova Scotia. Educated in Nova Scotia, 1895, managing editor of Sunday Scimitar, Cumberland Maryland, Special humorous writer on Baltimore American; sporting editor, Baltimore News. For fourteen years wrote the 'Dinkelspiel' papers on Baltimore News of which he was originator. Author of: *The John Henry Books* (series of comic stories in fifteen voumes), six books of comedy, *Li'L Verses for Li'l Fellers* (poems for children). Wrote and rewrote comic operas, several farces and musical comedies. Co-author of drama *Wildfire* and *Our Mrs. McChesney* written for Ethel Barrymore. Author of *Idle Moments in Florida*, 1921. Most successful play was *Experience*.

HOBART COLLEGE, an institution of higher learning situated at Geneva, N.Y., conducted under the auspices of the Episcopal church. It had its beginnings in a theological school founded in 1813 by Trinity Church, New York City, and located at Fairfield, N. Y. In 1821 the school was removed to Geneva, where it was chartered as Geneva College. It became Hobart College in 1860 in honor of Bishop Hobart of New York, who was one of its founders and, as rector of Trinity, obtained increased grants fro that church for its support. It has a co ordinate college for women, known a William Smith College, opened in 190 The students in 1922 numbered 281 an the teaching staff 26 under the pres dency of M. Bartlett.

HOBBEMA, MEYNDERT (*c.* 163 1709), famous Dutch landscape painte lived and died in poverty and obscurity made unsurpassed studies of sober an peaceful landscapes, perfect in the kind; widely different manner from tha of his contemporary Ruysdael, but the works often confused through deale forging signatures.

HOBBES, THOMAS (1588-1679 Eng. philosopher; *b.* Malmesbury; ed. a Magdalen Hall, Oxford, and in 1608 be came tutor to the *s.* of William Caven dish, 2nd Earl of Devonshire, remainin with this family, except for two sho intervals, for the rest of his life. H travelled abroad with his pupil, wh became an intimate personal friend. H became inbued with the scientific rathe than the philosophic spirit of his da He then devoted himself to the study the classics. Cavendish *d.* in 1628, an H. became tutor to the *s.* of Sir Gervas Clifton, 1629, then to the Earl of Devon shire, *s.* of his former pupil, 163 About this time he began to devot himself to philosophy. The years 164 51 he spent abroad. The idea of h great book, *Leviathan*, was forming i his mind, and he devoted most of h attention to it. His ideas were certainl affected by the civil strife of the tim The *Leviathan* was a great monster mad up of a mass of human beings. Whi he anticipated later thinkers in believin that government was for the benefit of th people as a whole, he believed that th civil power residing in the people wa absolute, and that no internal organis tions which might conflict with it shoul be allowed to exist. In 1666 some b lieved that his 'atheistic' teaching ha provoked the wrath of Heaven in th shape of the great plague, and H. wa alarmed lest he might be tried for heres However, the king protected him, but h was obliged to get his books printed ou of England. His reputation abroad wa very great. He worked on at translatin Homer and other things till near the en dying aged ninety-one. He has left th mark of his work on many subjects; i mathematics only was he thoroughl unsuccessful. He laid the foundation o which political philosophers of the XI cent. were to build.

HOBBY.—(1) hob or hobgoblin; (2 a slow and steady horse; (3) an occup tion followed as a pastime. Classic

examples of riding a h. are to be found in Sterne's *Tristram Shandy*.

HOBOKEN, a city of New Jersey, in Hudson co. It is on the Lackawanna, the West Shore, and the Lehigh Valley railroads, and on the Hudson River, opposite New York City, with which it is connected by ferries and by tubes. It has an extensive system of docks and is the terminal for several important European steamship lines. Its manufactures are of considerable importance and embraces a great diversity. It is the seat of Stevens Institute of Technology and other institutions. There are also several private preparatory schools, national banks, daily and weekly newspapers. Pop. 1920, 68,166.

HOBOKEN (51° 11′ N., 4° 21′ E.) town, Belgium. Pop, 13,000.

HOBSON, RICHMOND PEARSON (1870), American naval officer and author; b. Greensboro, Ala. He graduated at the United States Naval Academy in 1889 and later pursued studies in naval engineering and construction in Paris. He served in the navy on several cruises, but most of the time was assigned to land duty as superintendent of fleet construction. In the Spanish-American war he leaped into prominence as a national hero because of his daring in sinking the collier Merrimac across the entrance of Santiago Harbor, Cuba, with the design of blocking the exit of Cervera's fleet. While this end was not gained, the heroism of the exploit stirred the popular imagination and elicited the admiration even of the enemy. He resigned from the navy in 1904; was elected to Congress in 1907 and re-elected for the three following terms. He has lectured widely and written extensively on naval subjects. He has been an active advocate of national prohibition. His publications include *Why America Should Hold Naval Supremacy*, 1903; *Diplomacy and the Fleet*, 1908, *In Line of Duty*, 1909; *Fortification of the Panama Canal*, 1911; *Our Country's Destiny*, 1913, *America and the World War*, 1917; *The Great Reform*, 1918; *Alcohol and the Human Race*, 1919. In 1921 he organized the American Alcohol Education Association.

HOBSON'S CHOICE, phrase derived from Thomas Hobson (*c.* 1544-1630), the Cambridge carrier, commemorated by Milton. He insisted on horses being taken from his stable only in their regular turn—hence meaning, 'this or none.'

HOCHE, LAZARE (1768-97), Fr. soldier; commanded army of Moselle against Austrians, whom he defeated at Weissenburg; ended Vendée insurrection and defeated Royalists at Quiberon and Penthiévre, 1795; obtained command of Sambre and Meuse force, 1796, and routed Austrians at Neuwied; War Minister, 1797; *d.* at Wetzlar.

HOCHST (50° 7′ N., 8° 30′ E.), town, Hesse-Nassau, Germany; machinery, dyes. Pop. 20,000.

HOCKEY, a game which has its origin in Scotland, where it is known as shinty. The game as it is known in the United States, however, is known as ice hocking and is played almost entirely on the ice. It was introduced into the United States from Canada in 1894. It has become very popular. It is played with a vulcanized rubber disc known as the puck, which is advanced by lifting or pushing with hockey sticks about 4 feet long, terminating in a curved end. The object of the game is to drive the puck into the opponent's goal which counts as one goal. The goals are pockets of netting extending back from posts and are 6 feet wide and 4 feet high. The players number 7, which consist of 4 forwards and three for defense. Nearly all American colleges in the northern latitudes maintain hockey teams and play for records and championship during the winter.

HOCKING, JOSEPH (1855), English novelist; land surveyor, 1878; he entered ministry of United Methodist Free Church, 1884; has written many books, including *Zillah*, 1892; *All Men are Liars*, 1895; *And Shall Trelawney Die?*, 1897; *The Day of Judgment*, 1915; *The Path of Glory*, 1917; *Price of a Throne*, 1918; *Everlasting Arms*, 1920.

HOCKING, SILAS KITTO (1850), Eng. novelist; minister of the United Methodist Free Church from 1870 to 1896; devoted himself to literature; has written some sixty novels, among which are *Her Benny*, 1879; *God's Outcast*, 1898; *The Beautiful Alien*, 1916; *His Own Accuser*, 1917; *Watchers in the Dawn*, 1920.

HOCUS, OR HOCUS POCUS, a supposed corruption of *Hoc est corpus* used by priests in the Mass; was used (*temp.* James I.) as a cant-term for a juggler's trick. Its later meaning refers to a hoax with criminal intent.

HODEDA (14° 36′ N., 43° 4′ E.), fortified town, Arabia; exports coffee, grain. Pop. *c.* 30,000.

HODGE, CHARLES (1797-1878), Amer. Presbyterian divine; studied in America and at Paris, Halle, and Berlin; prof. at Princeton Theological Seminary.

HODGES, GEORGE (1856-1919).

Episcopal theologian; *b.* Rome, N. Y. He graduated in divinity from the Berkeley Divinity School, Conn. in 1881, when he became assistant rector and rector of the Calvary Church, Pittsburgh, Pa. In 1894 he resigned the rectorship on his appointment as dean of the Episcopal Theological School, Cambridge, Mass. He was prominent as a Low Broad churchman and the author of a number of religious works.

HODGSON, BRIAN HOUGHTON (1800-94), Eng. administrator; Orientalist and naturalist; spent many years in the East Indian service, and was a noted authority on Buddhism and natural history; pub. *Literature and Religion of Buddhists*, 1841.

HODMEZÖ-VASÀRHELY (46° 27′ N., 20° 20′ E.), town, Hungary. Pop. 62,445.

HODOGRAPH, curve obtained by joining ends of lines drawn from any point parallel and proportional to the velocity of a moving particle.

HODSON, WILLIAM STEPHEN RAIKES (1821-58), Brit. soldier; served against Sikhs; accused of misuse of regimental money, 1855; at outbreak of Indian Mutiny raised regiment of irregular horse, known as H.'s Horse; greatly distinguished himself during war, and at fall of Delhi took the old emperor prisoner and slew his sons; killed during attack on Lucknow.

HOE, ancient gardening tool, useful for making holes for planting; in XVII. cent. many h's commenced to be united in a Horse Hoe (grubber) for breaking up ground in fields.

HOE, RICHARD MARSH (1812-1886), inventor; *b.* New York; *d.* Florence, Italy. In association with his *b.* Peter S. Hoe, he developed printing machinery which revolutionized the methods of newspaper publication, beginning in 1846 with a rotary printing device known as 'Hoe's lightning press'. This was displaced by the web-perfecting press, which enabled printing to be done on both sides of a sheet and also provided cutting and folding mechanism. He was the *s.* of Robert Hoe, the inventor of the original Hoe printing press, an Englishman who came to the United States in 1813.

HOF.—(1) (50° 19′ N., 11°54′ E.),s town, Bavaria, Germany; manufacture textiles. Pop. 1910, 41,120. (2) (60° 34′ N., 11° 59′ E.) town, Hedemarken, Norway. Pop. 5,000.

HOFER, ANDREAS (1767-1810), Tyrolese statesman; with Austrian encouragement raised Tyrol against Napoleon, April, 1809; Napoleon recovered possession in July, but country rose as he departed; H. came from hiding; won battle of Iselberg against Lefebvre; ruled for three months; forced to fly in Oct. 1809; betrayed, he was shot by Napoleon's orders.

HOFFDING, HAROLD (1843), Dan. philosopher; prof. Copenhagen Univ.; works trans. into many languages.

HOFFMANN, CHARLES FENNO (1806-1884), editor and poet; *b.* New York; *d.* Harrisburg, Pa. He was a student at Columbia College and entered the legal profession, but deserted law for literature in 1833, when he founded and edited the Knickerbocker Magazine. Later he was editor of the American Monthly Magazine and also connected editorially with the New York Mirror and Literary World. Meantime he published books on Western and Indian themes including a successful novel, *Greyslaer*, a romance of the Mohawk, but he became chiefly noted as a poet, especially for his songs, which had a strong popular appeal. When 43 his mind failed, and he spent the rest of his life in an insane asylum at Harrisburg.

HOFFMAN, FRIEDRICH (1660-1742), Ger. physician; practised and taught at Jena and afterwards at Minden; first prof. of Medicine, 1693, and also of Natural Philosophy at Halle; member of many foreign learned societies, and author of many medical works.

HOFFMAN, AUGUST HEINRICH, HOFFMAN VON FALLERSLEBEN (1798-1874), Ger. poet; *b.* Fallersleben and called himself after his birthplace; prof. at Breslau Univ.; dismissed, 1842, on account of his *Unpolitische Lieder*; also wrote Volkslieder.

HOFFMAN, ERNST THEODOR WILHELM (1776-1822), Ger. novelist; *b.* Königsberg (Prussia); studied law; for some time musical director at Bamberg, Leipzig, and Dresden Theatres; composed several operas; became famous *Phanatasiestucke in Callots Manier* and *Die Serapionsbruder* (weird stories), and *Die Elexiere des Teufels* (novel).

HOFFMAN, FRANÇOIS BENOÏT (1760-1828), Fr. critic and author of amusing operas.

HOFFMANN, JOHANN JOSEPH (1805-78), Ger. Orientalist; wrote various Jap. studies and *Catalogus librorum et manuscriptorum japonicorum* 1845.

HOFMANN, AUGUST WILHELM VON (1818-92), Ger. chemist; first director of School of Practical Chem.

London; became prof. of Chem. in Berlin, 1864. He and his pupils brought the coal-tar industry under notice. His researches on analin, rosanilin, and quinoline red are classics.

HOFMANN, JOHANN CHRISTIAN KONRAD VON (1810-77), Ger. theologian and historian; pub. *Theologische Ethik, Schutzschriften, Drr Schirftbeweis.*

HOFMANN, JOSEF (CASIMIR) (1876), a pianist, *b.* in Cracow, Poland. He began the study of the piano under his father, who was a prominent musician, and at the age of seven attracted the attention of Rubinstein, the great pianist. In 1887 he began a tour in the United States, but owing to his age was obliged to abandon it on account of the interference of theSociety for the Prevention of Cruelty to Children. At that time, however, he gave unmistakable evidence of his remarkable talent. He returned to Europe and spent several years in study under leading masters of the piano. In the years following he made annual concert tours of Europe and the United States and spent much of his time in the United States. He was considered by many to be one of the two or three greatest living pianists. He composed many pieces for the piano and wrote much on musical topics.

HOFMANN, MELCHIOR (*c.* 1498-1544), Ger. Anabaptist preacher; at first a furrier, became follower of Luther; adopted extreme views on Eucharist; preached at Strassburg and Emden; became Anabaptist; sometimes thought anti-Trinitarian, but was really Valentinian.

HOFMEISTER, WILHELM FRIEDRICH BENEDICT (1824-77), Ger. botanist; prof. of Bot. at Heidelberg and an eminent morphological botanist; pointed out the analogies between *Coniferoe* and *Cryptogams.* He also worked on *Bryophytes, Pteridophytes,* and the embryology of plants.

HOFMEYER, JAN HENDRIK (1845-1909), South African politician and journalist; was for many years ruling spirit in Cape Colony of Afrikander Bond; supported Cecil Rhodes till Jameson Raid 1895; tried to influence Kruger and to prevent outbreak of war between Boers and British; was in favor of federation of S. African colonies.

HOFSTEDE DE GROOT, PETRUS (1802-86), Dutch prof., divine, and theological writer.

HOG. See PIG FAMILY.

HOGARTH, WILLIAM (1697-1764), Eng. artist and engraver; *b.* London; *s.* of a schoolmaster; apprenticed to an engraver, and later set up in that calling on his own account; m. Jane, *d.* of Sir James Thornhill; achieved his first artistic success with his series of six paintings representing *The Harlot's Progress,* 1731, shortly afterwards engraved by himself. This series was followed by eight scenes depicting *The Rake's Progress,* 1735; *Marriage a la Mode, Industry and Idleness, The Stage Coach, The March to Finchley,* portraits of Garrick, Lavinia Fenton, scriptural pieces, etc. H. achieved immediate success with his engravings, but his original paintings found little appreciation in his own day, and many remained unsold at the time of his death. In portraiture he was more successful. H. is now recognised as one of the great Eng. artists. His purpose, in his more famous series, was to paint a story dramatically in a set of scenes, and the best of these are at once remarkable for realism and masterly humour, for H. was not only great as an artist, but equally so as a satirist and humorist.

HOGG, JAMES (1770-1835), Scot. poet, known as 'the Ettrick Shepherd'; herded cattle and sheep in his youth; made disastrous ventures in farming; pub. *Scottish Pastorals,* 1801; *The Mountain Bard,* 1807; *The Queen's Wake,* 1813—his best work in poetry. Other writings include collections of tales, and a treatise on diseases of sheep.

HOGG, THOMAS JEFFERSON (1792-1863), Eng. author; was the Oxford associate andsubsequent biographer of Shelley.

HOG ISLAND, a tract of land, S.W. of Philadelphia, on which in 1917 and the following years were created great shipyards which constituted the largest shipbuilding plant in the world. Hundreds of vessels were built here under the direction of the United States Shipping Board. The plants were disbanded and dismanted in 1922.

HOGMANAY, name given in parts of Scotland to New Year's Eve; also called *hogg-night.*

HOGSHEAD, standard measure for liquids; made 63 wine gallons or 52½ imperial gallons in 1423.

HOHENASPERG (48° 57′ N., 10° 5′ E.), former fortress, Württemberg, Germany.

HOHENFRIEDBERG, HOHENFRIEDEBERG (50° 54′ N., 16° 14′ E.), village, in Silesia, Prussia. During the War of Austrian Succession great battle was fought at H., June 3, 1745, between Prussians under Frederick the

Great, and Austrians and Saxons under Prince Charles of Lorraine; total defeat of Allies, whose losses were 15,224; Prussian losses about 4,700.

HOHENHEIM (48° 42′ N., 9° 12′ E.), small town, Württemberg, Germany; famous agricultural coll. Pop. *c.* 300.

HOHENLIMBURG (51° 20′ N., 7° 33′ E.), town, Westphalia, Prussia. Pop. 1910, 13,900.

HOHENLINDEN (48° 9′ N., 11° 59′ E.), village, Upper Bavaria; scene of defeat of Austrians, under Archduke John, by French, under Moreau, Dec. 3, 1800.

HOHENLOHE, Ger. family, which held title of Count from XII. cent., and attained princely rank in XVIII. cent. The family was frequently subdivided, and many of its branches are now extinct; but there remain those of Bartenstein, Jagstberg, Schillingsfürst, and Waldenburg, which represent the R.C. line of H.-Waldenburg, founded in 1551; and those of Ingelfingen, Langenburg, and Ohringen, which are descended from the Prot. family of H.-Neuenstein, founded at the same time. The most distinguished member of the family was Chlodwig Karl Victor, 1819-1901, prince of H.-Schillingsfürst; he at first entered service of Prussia, but left it in 1846; in 1866 he became chief minister of Bavaria; aimed at uniting N. and S. Germany; opposed Ultramontanes in 1869, and had to resign office in 1870; ambassador to France, 1873-80; appointed gov. of Alsace-Lorraine in 1855; Imperial Chancellor in 1894. Other notable members of family are: Friedrich, prince of H.-Ingelfingen, 1746-1818, who served against Napoleon and was defeated at Jena; Ludwig, 1765-1829, prince of H.-Waldenburg-Bartenstein, who became marshal of France; Alexander, 1794-1849, prince of H.-Waldenburg-Schillingsfürst, who became priest and is credited with performing supernatural cures; and H. Ingelfingen, 1827-92, prince of Kraft, who served in Franco-Ger. War of 1870-71.

HOHENSTAUFEN (48° 44′ N., 9° 45′ E.), village, Württemberg, Germany; site of ruined castle which belonged to H. family from 1080 till 1525, when it was destroyed in Peasant Rising.

HOHENSTAUFEN, Ger. family, holding imperial crown, 1138-1254; founded by Frederick von Büren, whose *s.* Frederick took name H. from H. Castle; emperors of family were Frederick I., 1152-90, Henry VI., 1190-97, Philip I., 1198-1208; Frederick II. 2112-50; Conrad IV., 1250-54.

HOHENSTEIN.—(1) (50° 47′ N., 12° 43′ E.), town, Saxony, Germany. Pop. 15,600. (2) (53° 34′ N., 20° 18′ E.), town, E. Prussia. Pop. 2,500.

HOHENZOLLERN, Ger. imperial family; name derived from castle in S. Germany; family first came into prominence in 1415, when one of its members became Elector of Brandenburg; in 1701 Frederick III., Elector of Brandenburg, became first King of Prussia, and in 1871 William I., seventh King of Prussia, became first Emperor of Germany; former Kaiser William II. is present head of family.

HOKKAIDO, Jap. term, denoting N. part of empire.

HOKUDSI (1760-1849), famous Jap. painter; works include great book of color prints, *Mangwa.*

HOLBACH, PAUL HEINRICH DIETRICH BARON D' (1723-89), Fr. philosopher; denounced Christianity as source of all ill; friend of *Encyclopoedists.*

HOLBEACH (52° 49′ N., 0° 1′ E.), town, Lincolnshire, England. Pop. 5,259.

HOLBEIN, HANS, THE ELDER (*c.* 1460-1524), Ger. artist; painter of average ability; chiefly religious subjects; examples at Basel, Munich, and Augsburg, also at Hampton Court. He is chiefly famous as being the *f.* of an illustrious son.

HOLBEIN, HANS, THE YOUNGER (1497-1543), Ger. artist; *s.* of Hans H. (*q.v.*); *b.* Augsburg, in his youth assisted his *f.*, subsequently going to Basel, where he became a member of the painters' guild, 1619. Here and at Lucerne he was extensively engaged in portraiture, mural decoration, and the production of woodcuts, including the famous series, 'The Dance of Death.' In 1526 he visited London and executed many fine portraits of notabilities, but returned to Basel in 1528. He was settled in London again in 1532, became court painter to Henry VIII., and subsequently *d.* of the pestilence. H. ranks amongst the greatest of the old Ger. masters. His notable works include *The Ambassadors* (National Gallery), *Anne of Cleves* (Louvre), *Duke of Norfolk* (Windsor), *Jane Seymour* (Vienna).

HOLBERG, LUDWIG, BARON (1684-1754), Dan. author; *b.* Bergen lived in England, 1706-8; became prof. of Metaphysics at Copenhagen, subsequently of Rhetoric and History. His earliest literary successes were his satirical poems, *Peder Paars, Hans Mikkelsen's Metamorphoses,* etc. Upon

the opening of the Dan. theatre at Copenhagen, H. supplied its stage with a long series of brilliant comedies, which have taken a high place in Dan. literature. Other important works include his *Autobiography*, *History of Denmark*, and *History of the Jews*.

HOLBORN, central metropolitan borough, London, England; contains Chapel of Ethelreda, St. Andrew's Church, City Temple, Lincoln's Inn. Gray's Inn, Brit. Museum, and many other public buildings.

HOLCROFT, THOMAS (1745-1809), Eng. dramatist; his melodrama, *The Road to Ruin*, 1792, was highly successful, and is still played.

HOLDEN, CHARLES FREDERICK (1851-1915), naturalist; *b.* Lynn, Mass. After studying at the U. S. Naval Academy, he served as assistant curator at the American Museum of Natural History, New York City, from 1871 to 1875. Later he became professor of zoology at Throop University, Pasadena, Cal., also honorary curator of the University Museum, and president of that city's board of education. He was notable as a lecturer and writer on popular science and on animal and ocean life.

HOLDEN, EDWARD SINGLETON (1846-1914), astronomer and educator; *b.* St. Louis, Mo. He was educated at Washington University and the U. S. Military Academy, West Point. He became in order professor of mathematics at the Naval Academy in 1873; director of the Washington Observatory at Madison, Wis., in 1881; president of the University of California in 1885; director of the Lick Observatory, San Jose, Cal. in 1888; and in 1901 librarian at West Point. His publications include works on astronomy and a life of Sir William Herschel.

HOLDEN, SIR ISAAC, BART. (1807-97), Eng. inventor; after a life of struggle, invented a wool-comber, 1847, and established, near Paris, wool-combing industry, which brought him wealth.

HÖLDERLIN, JOHANN CHRISTIAN FRIEDRICH (1770-1843), Ger. poet; *b.* Lauffen; became insane, 1802; wrote excellent lyrics; *Empedokles* (tragedy, unfinished), *Hyperion* (romance in letters), etc.

HOLDHEIM, SAMUEL (1806-60), Jewish nationalist; rabbi at Berlin.

HOLGUIN (20° 50′ N., 76° 29′ W.), town, Cuba, W. Indies. Pop. 7,592.

HOLIDAYS, originally 'holy' days, *i.e.* days on which no work should be done; in modern England Bank H's are the h's recognised by the State; these are not observed in Scotland, nor is Good Friday, which is customarily kept in England. Quebec still observes some of the old feast days (the h. properly so called), but the rest of the Dominion and the Brit. Colonies have their own new systems.

In U.S.A. there are no legal h's; the presidential proclamation of Thanksgiving Day (usually last Thursday in Nov.) makes it legal holiday in Columbia and the Territories, though it is generally observed. Other h's generally observed are Independence Day (July 4), Labor Day (first Monday in Sept.), and these are legal in most states, which have also various other statutory h's.

HOLINSHED OR HOLLINGSHEAD, RAPHAEL (*d. c.* 1580), Eng. chronicler; wrote *Chronicles of England, Scotland, and Ireland* (pub. 1578), from which Shakespeare's Eng. hist. plays were largely drawn.

HOLKAR, title or Mahratta ruler of Indore.

HOLL, FRANK (1845-88), Eng. artist; R.A., 1884; achieved distinction as painter of genre subjects, but later devoted himself to portraiture, his sitters including Gladstone, Chamberlain, Bright, Lords Wolseley and Roberts.

HOLLAND OR NETHERLANDS, mar. kingdom, N. Europe (50° 46′-53° 33′ N., 3° 21′-7° 10′ E.), consisting mainly of deltaic deposits of Rhine, Maas, and Scheldt; much of surface 8 ft. below sea-level and protected by embankments and sand dunes; highest point 655 ft. Is bounded by Germany on E., Belgium on S., and elsewhere by North Sea. Within historic times sea has invaded land, transforming Flevo lake into the Zuider Zee (South Sea); anc. continental coast-line lay along Frisian Islands (Texel, Vlieland, Terschelling, Ameland, Schiermonnikoog, Rottum, Borkum), now separated by the Wadden (Shallows) from the mainland. Since the 16th cent. over a million ac. have been reclaimed from sea, lake, and river, and schemes for recovery of Zuider Zee have been passed (June, 1918); time required is thirty-three years, and capital cost $750,000,000; four separate areas to be diked cover total area of 521,170 ac., with fresh-water lake in centre. Alluvium (59 per cent. of area) consists of fens, clays, and sands; clays—especially of newly-reclaimed polders, *i.e.*, low-lying basins embanked and then pumped dry—are most fertile; diluvial strata (40½ per cent.) chiefly sands and gravels, not very fertile.

Estuary of the Maasland Scheldt contains many islands—*e.g.*, N. and S. Beveland, Walcheren, etc. Canals and waterways (5,000 m.) much more important than railways (2,382 m). and metalled roads. Climate resembles that of England, but is more variable. Principal occupations are grazing and agriculture. Cattle of superior breeds give rise to trade in butter and cheese prepared in factories (Gouda and Edam); horticulture, especially production of bulbs, flowers, and fruit, has been carried on for centuries; fisheries of some importance; chief industries are brewing, distilling, manufacture of sugar, vinegar, bricks, and stoneware, margarine, machinery, cocoa, salt, diamond-cutting, shipbuilding; coal-mining in Limburg prov. is increasing. Holland is a free-trade country; exports are food products and commodities mentioned above; imports, cereals and flour, iron and steel, textiles, raw materials, and food products. The official cap. is the Hague, Amsterdam is the commercial cap., and Rotterdam and Flushing are the chief ports.

Population and Area.—Inhabitants of N. descended from anc. Frisians, of centre from Franks, of *s.* from Saxons; mixed with French Huguenots, Walloons, Scots, etc.; Jews mostly in Amsterdam. Area, 12,648 sq. m.; pop. 6,260,000.

Religion.—Religious census of 1909 gave 2,588,261 as belonging to Dutch Reformed Church, and 746-186 other Protestants; also 2,053,021 Roman Catholics; 10,082 Jansenists; 106,909 Jews. Protestants are strongest in Friesland, Groningen, and Drenthe; Roman Catholics in N. Brabant and Limburg. There is no State Church, but state makes allowances to all Churches.

Education.—Primary education is free and (since 1900) compulsory between ages of six and thirteen. Intermediate instruction in 'burgher night-schools' for those engaged in industrial and agricultural work, and in 'higher burgher schools' for technical education, is inexpensive; in connection with these are schools of agriculture, horticulture, and forestry. Above these are gymnasia, preparing for univeristies of Leyden, Utrecht, Groningen, and Amsterdam.

The government is a constitutional and hereditary monarchy, with a States-general of two chambers. The first chamber has 50 members, elected indirectly by the provincial states from the wealthiest citizens; it holds office for nine years, one-third of number retiring every three years. The second chamber, of 100 members, is elected directly by single-member constituencies for four years (electors to be 25 years old, members 30). Justice is administered by a high court at the Hague (seat of government) and several other tribunals.

Colonial Possessions.—Holland owns parts of the E. Indies, and has less important possessions in the W. Indies. E. Indies possession (with areas in sq. m.) are: Java and Madura, 50,557; Sumatra, 161,612; Borneo, W. coast, 55,825; Borneo, S. and E., 156,912; Billiton, 1,863; Banka, 4,446; Riau-Lingga Archipelago, 16,301; Celebes, 72,070; Molucca Islands, 43,864; New Guinea, 151,789; Timor Archipelago, 17,698; Bali and Lombok, 4,065. Total area, 735,000 sq.m.; pop. 47,000,000.

W. Indies possessions are: Dutch Guiana, 46,060; Curacao Colony, 403. Total area, 46,463 sq. m.; pop. 150,000. Total area of Dutch colonies, 781,463 sq. m.; pop. 47,150,000.

History.—For one or two centuries B.C. the land we call Holland was occupied by the Frisians and Batavi. The country was conquered by Rome, but let slip in the 4th cent. on the coming of the Franks. It was converted to Christianity about the 8th cent., and formed part of the empire of the Karlings. The name Holland was given to the district which still forms the provinces of N. and S. Holland in the 11th cent., when the counts of Holland rose to importance. The various states which made up the Netherlands passed, some by marriage, some by conquest, to the dukes of Burgundy, and then by descent to the Emperor Charles V. He was a firm ruler, under whom trade made the country prosperous; but the accession of his *s.*, Philip II., in sympathy a Spaniard, and nothing of a Dutchman, meant terrible oppression for the country by king and Inquisition. The result was the famous revolt, partly political, partly religious, under William of Orange, a member of a princely house in the S. of France. William's great protagonist in war was the Duke of Alva.

In 1572 a successful rising took place of the N. provinces (the southern remained under Span. and then Austrian domination till they became Belgium). William of Orange became virtual ruler. The Union of Utecht was formed in 1579, and the provinces declared themselves free of Span. control, 1581. William was murdered at Philip's instigation in 1584. The war with Spain grew fiercer, but in 1609 a truce was signed for twelve years. But the next few years were largely taken up with religious struggles between the Orthodox and Arminian parties, with the result that the Arminians were banished. Thenceforward Holland grew rapidly, not only politically, for she became famous in arts and science as well. In the 17th cent. she exerted a greater influence in Europe

than ever before or since. She became a rival of England in colonizing and transport activities, and there was war between the two countries under Cromwell and Charles II. The Dutch wars 1652-4, 1664-7, 1672-8, left things much as they were. The second war saw the Dutch fleet in the Medway and Thames. In 1672 the English and French made an abortive attempt to invade Holland, and John de Witt, who had really guided the affairs of the Dutch, became so unpopular that he was murdered. William of Orange now came into power, and the peace of Nimeguen, 1678 ended the war.

William of Orange became King of Britain in 1688, and Dutch troops fought with English in the campaigns against Louis XIV. After William's death ,in 1702, a republic was established once more, and a period of general decline set in. By the Peace of Rastatt, 1714, the Span. Netherlands which Frnace had tried to obtain, became Austrian. But the Dutch Republic ceased from that time to have much say in European politics. In 1747 William IV. of Orange was elected Stadtholder of all the seven provinces, and the office was declared hereditary in his family. War broke out with Britain as the result of a quarrel over naval matters in 1780, and by the Treaty of Paris, 1793 certain colonies were surrendered to Britain. Meanwhile there was a party adverse to the houes of Orange, and after internal disputes William of Orange was re-established under Prussian and British auspices.

But the Fr. Revolution again upset matters, and in 1795 the country was conquered by Republican troops. The Orange family fled, and the anti-Orange party was overjoyed at the Fr. victory. A Batavian republic was established; nominally, a Fr. alliance was formed; practically, the country was under Fr. domination. Britain acquired the Dutch colonies. There was a short respite from war after the Peace of Amiens, 1802, but soon came more conflicts, and in 1806 Napoleon made his *b.* Louis Bonaparte, King of Holland. A revolt broke out in 1813, and William I. was recognized as sovereign prince, and as king in 1815, the Belgian provinces being united to the Dutch. But a quarrel arose between the Dutch and Belgians (different in many ways by race, religion, and temperament), and an independent kingdom of Belgium was established in 1831; the constitution was revised in 1848. Qaurrels about religious education took place continually during the reign of William III., 1849-90, the *f.* of the present Queen Wilhelmina. During her minority, 1890-8, Queen Emma, widow of William III., acted as regent. Another political question has been that of the suffrage; in 1896 it was extended so as to almost double the number of electors. In 1901 the queen married Prince Henry of Mecklenburg-Schwerin. During the S. African war, Dutch sympathies were strongly with the Boers. In 1909 Princess Juliana was born. Holland remained neutral during the Great War, and was the asylum of the Ger. Kaiser after Nov. 9, 1918, the government refusing to yield him up.

Dutch Language and Literature. Dutch (officially *Nederlandsch*) is one of the Low-German languages, of the same family as Old English and Frisian. Its development belongs to three periods *Old* Dutch, derived from various Teutonic tribal dialects, which first began to take shape about the 9th cent.; *Middle* Dutch (12th to end of 14th cent.), which became the language of a considerable portion of Germany, Belgium, and N. France; and *Modern* Dutch, which dates from the 15th cent. Dutch is spoken not only in Holland, but in the Union of S. Africa, by colonials of Dutch descent who use a *patois* known as the 'Taal.'

The Middle Dutch period witnessed the introduction of numerous epics and romances, chiefly derived from foreign sources, including *Floris en Blancefloer*, *Reinaert* (Reynard the Fox), *Roman van Lancelot.* During the 14th cent., however, the flourishing trade of Holland had made that country one of the chief industrial markets of the world, and so with the rise of commercial prosperity there gradually came into being a more distinctive form of expression, out of which grew a literature which was characteristic of the people and the times. This literature began with Jacob van Maerlant, whose social satires, under the name of *Naturen Bloeme*, appeared about 1263, and was followed in 1284 by his greater work, *De Spieghel Historiael* (Mirror of History); after him came other writers, chiefly on historical or on moral subjects, including Jan van Boendale, 1280-1365, Jan de Weert, and Melis Stoke. The romantic school of poetry was still represented by the works of Jan van Heelu, Hein van Aken, and Dirk Potter; but their influence was not lasting, and the moralists of the Maer-

Modern Dutch is represented in its pioneer stage by the works of Coornhert, Spieghel, and Visscher, and a master stylist in Pieter Hoofdt, 1581-1647, whose work in history, poetry, and drama is of high character. The greatest poet Holland has produced was Joost van Vondel, 1587-1679, whose tragedies, chiefly on Scriptural subjects, are marked by great imagination and expression, and are said to have influenced Milton. Jakob Cats, 1577-1660 was a

poet of another order, whose work was invariably witty though sometimes coarse, and secured a lasting popularity. Other writers of outstanding abilities belonging to this period include van der Goes, Oudaen, and the historian Geeraerdt Brandt. The 18th cent. saw a decline in Dutch poetry, but a writer of remarkable attainments arose in Willem Bilderdijck, 1756-1832, whose influence on the Dutch literature was very marked; and the 19th cent. witnessed the rise of many writers of poetry, history, fiction, and belles-lettres whose works are distinguished by charm and originality.

Flemish Literature.—As distinct from the Old Dutch literature, modern Flem. literature came into existence during the early part of the 19th cent. Its exponents include a number of poets and realistic and historical novelists, amongst whom may be named Karel Ledeganck, Jan van Beers, J. T. van Rijswijck, P. van Duyse, Peter van Kerckhoven, J. L. D. Sleeckx, Jan Snieders, Julius de Geyter, Emmanuel Hiel, and numerous others.

HOLLAND. (1) North, prov. of Netherlands (52° 35′ N., 4° 50′ E.), between Zuider Zee and North Sea. Flat low (large portion below sea-level and protected by dykes), and fertile; produces cattle, cheese, flower bulbs (Haarlem), potatoes, etc. Fishing, shipping, and shipbuilding are carried on. Chief towns, Amsterdam and Haarlem. Area, 1,070 sq. m.; pop. 1,110,000. (2) South, prov. of Netherlands (52° N., 4° 30′ E.), extending along North Sea northwards from the mouth of Maas. Low and fertile, and produces cattle, cheese, flowers, fruits, bricks, gin; shipping and shipbuilding are carried on. Chief towns, the Hague, Rotterdam, Leyden, Area, 1,166 sq. m.; pop. 1,391,000.

HOLLAND, a city of Michigan, in Ottawa co. It is on the Pere Marquette Railroad, and on the Black river, at its mouth, and on Lake Michigan. It is an important industrial community and has manufactures of furniture, leather, pianos, laundry baskets, etc. It is the seat of Hope College and the Western Theological Seminary, both institutions of the Dutch Reformed Church. Pop. 1920, 12,168.

HOLLAND, an unbleached linen cloth originally manufactured in H.

HOLLAND, CHARLES (1733-69), Eng. actor, of days of Garrick; his *s.* Charles 1768-1849, was also a prominent player.

HOLLAND, ERNEST O. (1874), College president; *b.* in Bennington, Ind. Bachelor of Arts, University of Indiana, 1895. 1909-1910 at Columbia College, fellow in education, 1912 Doctor Philosophy. 1895-1900 taugth in high schools of Indiana. 1900-1905 head of English department at Boys High School, Louisville, Ky. 1905-1907 associate professor of education, junior professor, 1908-1908, professor secondary education; 1908-1911 at University of Indiana. 1911-1916 superintendent school, Louisville, Ky. Since 1916, president of Washington State College. Member Phi Beta Kappa, Advisory Board Reconstruction Educational Alliance. Author, The Pennsylvania State Normal School and Public Schools, 1912.

HOLLAND, SIR HENRY, BART. (1788-1873), Eng. physician; practised medicine with great success in London; travelled much abroad, and knew most eminent people of his time; author of works on medicine, travel, and other subjects.

HOLLAND, HENRY FOX, 1ST BARON (1705-74), Brit. politician; held various offices of state; Leader of Lower House, 1755, 1762; Paymaster-Gen., 1757.

HOLLAND, HENRY RICH, 1ST EARL OF (1590-1649), Eng. soldier and politician; arranged marriage between Charles I. and Henrietta Maria; changed sides several times during Civil War; taken prisoner at St. Neots, 1647, and executed, 1649.

HOLLAND, HENRY RICHARD VASSALL FOX, 3RD BARON (1773-1840), Brit. politician; Lord Privy Seal in 'All the Talents' Cabinet, 1806; Chancellor of Duchy of Lancaster, 1830; wrote *Memoirs of Whig Party.*

HOLLAND. JOHN PHILIP (1841-1914), submarine inventor; *b.* Liscannor, County Clare, Ireland. He studied submarine navigation in Cork while following the occupation of a school teacher, and when thirty years old came to the United States, where he pursued his calling at Passaic, N. J. In 1875 he invented his first submarine device, which was tested in the Passaic river and remained below water for 24 hours. His next experimental ventures were financed by the Fenian Brotherhood, with the design of building underwater boats that could attack British shipping. Two boats were constructed and one was successfully tested, but factional differences finally ended Holland's financial support from his Irish compatriots. Towards the close of the nineteenth century the U. S. government began to be impressed by the progress of submarine science abroad and the impres-

sion which Holland's further experimental craft made on several naval officers. A competition was held, in which American and foreign inventors were invited to tender bids for building a modern submarine that met the government's specifications. Holland's device won, and while the first boat built for the government failed, subsequent boats abundantly justified the claims he made for his design. Great Britain later adopted submarines of the Holland type, as well as Russia, Japan, Holland and other countries. He may be said to be the father of the modern submarine that dealt such havoc in the World War, as the most effective types were based on his conceptions. As the science advanced the machines developed went far beyond Holland's inventive scope, but he blazed the trail that made them possible.

HOLLAND, JOSIAH GILBERT (1819-1881), editor and author; *b.* Belchertown, Mass.; *d.* New York. He was trained as a physician, graduating from the Berkshire Medical College, and practised at Springfield, Mass., but medicine failed him as a livelihood, and he turned to teaching and journalism in various parts of the country. In 1849 he became one of the editors of the Springfield Republican and subsequently part owner of that journal. In 1870 he established the magazine known as the Century, then under the name of Scribner's Monthly, and edited it with great success to his death. He became known also as a novelist, poet and essayist, and earned popularity through a multitude of contributions to the journals he edited, afterwards collected and published in book form. He wrote a life of Lincoln.

HOLLAND, PHILEMON (1552-1637), Eng. translator of Gk. and Lat. classics. His *s.* Henry, 1583-*c.* 1650, wrote *Baziliologia* 1618 and *Heroologia*, 1620.

HOLLAND, WILLIAM JACOB (1848), zoologist and paleontologist; *b.* Jamaica, West Indies. He was educated for the ministry, graduating from the Princeton Theological Seminary in 1874; and occupied the pastorate of a Pittsburgh Presbyterian church from 1874 to 1891. Afterwards he served as chancellor of the Western University of Pennsylvania for two years. In 1897 he was appointed director of the Carnegie Museum at Pittsburgh and became an authority on museum administration and zoology. His scientific writings include works on butterflies and moths and on the fauna of past geological ages.

HOLLANDER, JACOB HENRY (1871), economist; *b.* Baltimore, Md. In 1891 he graduated from Johns Hopkins University, where he became associate professor of finance, and in 1904 professor of political economy. Meantime, 1897, he acted as secretary of the Bimetallic Commission abroad and as U. S. Commissioner ofr tax-law revision in Porto Rico as well as treasurer for that island's government. In 1905 he investigated the public debt of Santa Domingo for the U. S. government and later readjusted it as financial adviser for the Dominican Republic. His writings chiefly relate to economic and financial subjects.

HOLLES, DENZIL, BARON HOLLES (1599-1860), Eng. politician; *b.* at Houghton, Nottinghamshire. H. had considerable share in Resortation of Charles II., by whom he was appointed ambassador to Paris; concluded *Treaty of Breda*, 1667.

HOLLEY, MARIETTA (1850), author; *b.* Jefferson County, N. Y. When sixteen she began contributing poetry to country papers and afterwards prose contributions to national periodicals. Her writings, which revealed a distinctive humor and became popular at home and abroad, largely ambraced the sayings and doings of 'Josiah Allen's Wife' (her pseudonym) and vivacious descriptions of the diverting adventures of 'Samantha', a popular character who figures in most of her books.

HOLLIDAY, ROBERT CORTES (1880), author; *b.* in Indianapolis, Ind. Attended Art Students' League, New York, 1899-1902. University of Kansas, 1903-1904. 1904-1905 illustrator for magazines. 1906-1911 with Charles Scribner's Sons as bookseller. 1912 librarian with New York Public Library. 1913 reference librarian, New York School of Philanthropy. 1913-1914 assistant literary editor of New York Tribune, 1915 reporter and editor. Since 1916 with editorial departments of several book companies. Author: *Booth Tarkington*, 1918; *The Walking-Stick, Papers*, 1918; *Joyce Kilmer, A Memoir*, 1918; *Peeps at People*, 1919; *Broome Street Straws*, 1919; *Men and Books and Cities*, 1920; *Turns About Town*, 1921; *A Chat About Samuel Merwin*, 1921. Writes humorous and literary articles for magazines and newspapers.

HOLLOWAY, THOMAS (1800-83), Eng. patent medicine manufacturer, who made large fortune from pills and ointment, and built Holloway College for women, at Englefield Green, Surrey, 1887.

HOLLY, an evergreen shrub, *Ilex aquifolium,* with smooth grey bark and dark glossy leaves with spines on the margin. It will not grow in the shade of other trees. The flowers are *dioecious.* The female flowers have abortive *stamens* and the male ones an abortive *pistil.* The bright crimson berries severely irritate the digestive tract of man, but are eaten by birds. The wood, used for turned articles, is smooth, hard, white, even-grained, stains well, and when dyed black is used as imitation ebony.

HOLLYHOCK, ALTHEA ROSEA, a plant belonging to natural order *Malvaceae.* Flowert are regular *polypetalous, hypogynous,* and the *stamens* ripen first.

HOLLYWOOD, a suburb of Los Angeles, Cal., which is notable for the moving picture interest which have studios there. It is also a favorite residential place for those connected with moving pictures. It is a part of Los Angeles. Pop. about 40,000.

HOLMES, ARTHUR (1872), college president. *b.* in Cincinnati, 1894-1895 at Bethany College, Bachelor of Arts 1899 of Hiram College. 1903 University of Pennsylvania, Master of Arts, 1908 Doctor of Philosophy. 1899 ordained Disciples of Christ. 1899-1904 pastor at Sixth Church, Philadelphia. 1904-1905 Memorial Church, Ann Arbor, Michigan. 1905-1908 religious and educational director of Pennsylvania Railroad department of Y. M. C. A. 1908-1909 director of psychology. 1909-1912 assistant professor, 1908-1912 assistant director Psycho-Clinic, University of Pennsylvania. President of Drake University since 1918. Author: *Decay of Rationalism,* 1909. *The Conservation of the Child* 1912. *Principles of Character Making,* 1913. *Backward Children* 1915.

HOLMES, MRS. MARY JANE HOWES (1839-1907) novelist; *b.* Brookfield, Mass.; *d.* Brockport, N. Y. She married Daniel Holmes, a lawyer. Before engaging in authorship she was a school teacher, to which fact may be traced a didactic tendency perceptible in her numerous novels, one of which she produced annually. The circulation of her books, of which *Tempest and Sunshine* (1854) was perhaps the most popular, ran into the millions. They depicted domestic life, had a marked moral tone, and were free from sensationalism. She lacked fine literary qualities, but successfully appealed to the younger generation of her day and even later.

HOLMES, OLIVER WENDELL (1809-1894) poet, essayist, and physician. *b.* in Cambridge, August 29, 1809; *d.* in Boston, October 8, 1894. Educated at Phillips Academy, Andover, and Harvard, where he graduated in 1829. His famous poem *Old Ironsides* appeared in 1830 and was the means of saving the famous frigate 'Constitution' from destruction. After a year at the Harvard Law School he studied medicine three years in Paris and in 1836 received his degree of M.D. in the United States. He was professor of physiology and anatomy at Dartmouth, 1839-1840 and at Harvard 1842-1882 and practiced in Boston. The first of *The Autocrat of the Breakfast Table* appeared in the Atlantic Monthly. *The Professor at the Breakfast Table* was published in 1859 and *The Poet at the Breakfast Table* in 1872 and made the author famous at home and abroad. His novels were *Elsie Venner* 1861, *The Guardian Angel* 1868, and *A Mortal Antipathy* 1885. The volumes of verse *Urania* 1846 and *Astrea* 1850, brought him recognition as a poet. Among his most famous serious poems are *The Chambered Nautilus, The Last Leaf* and *The Iron Gate,* and in humorous verse, *The One Hoss Shay,* and *Evening, by a Tailor.* His later collection of poems were *Songs in Many Keys,* 1861. *Songs of Many Seasons* 1875, *The Iron Gate* 1880 and *Before the Curfew* 1887. Among miscellaneous works are 100 *Days in Europe* 1889, *Over the Teacups* and lives of Motley and Emerson. See Morse's *Life and Letters of Oliver Wendell Holmes.*

HOLMES, OLIVER WENDELL (1841), an American jurist, *b.* in Boston. He graduated from Harvard in 1861 and after service in the Civil War in which he was wounded, graduated from Harvard Law School in 1866. For many years he was professor of law at Harvard, and from 1899 to 1902 was chief justice of the Supreme Court of Massachusetts. In 1902 he was appointed associate justice of the United States Supreme Court. He was the *s.* of Oliver Wendell Holmes, the poet.

HOLMIUM, a metal of the rare earths, at present classed as an element, with an atomic weight of 163.5. According to many authorities, however, it is probably a mixture of two or more substances. It forms with Erbium and Thulium a group of metals which are still under investigation and all of which may be found to be mixtures of greater or less complexity. It is found in yttria, a rare earth discovered in 1794 by Professor Gadolin, of Abo in Finland. From this earth, Mosander, in 1843 separated terbia, which, in turn, was shown by Soret, Cleve, Thalen and Lecoq de Boisbaudran to consist of erbia, holmia, thulia and dysprosia.

Holmia is yellow in color, and gives pale yellow salts.

HOLOGRAPH, any writing written wholly in the handwriting of the person from whom it imports to proceed. It is most often employed in the writing of wills, and the name of two witnesses are required.

HOLOFERNES. See JUDITH, BOOK OF.

HOLST, HERMANN EDUARD VON (1841-1904), German historical writer; *b.* Fellin, Livonia; *d.* Freiburg, Germany. He engaged in journalism after studying at Dorpat and Heidelberg and in 1866 came to New York City, where he became American correspondent of the *Kolnich Zeitung* and an editor of a German-American journal. He returned to Germany in 1872 to occupy the chair of history at the University of Strassburg and later that of Freiburg. After relinquishing the latter post he travelled in England and the United States, where, from 1892 to 1900 he served as professor of history at the University of Chicago. He wrote the Constitutional and Political History of the United States, 8 vols., and a life of John C. Calhoun.

HOLSTEIN. See SCHLESWIG-HOLSTEIN.

HOLSTON RIVER, one of the headstreams of the Tennessee, flowing southwest from Smith county, southwest Virginia, into Tennessee through a mountainous country. It joins two other of the Tennessee's headstreams, the Clinch river, at Kingston, Tenn., and the French Broad river, a few miles east of Knoxville. Many small mountain brooks flow from it. Its length is about 350 miles and it is partly navigable for light craft.

HOLT, HAMILTON (1872), editor and lecturer; *b.* Brooklyn, N. Y. He was educated at Yale and Columbia Universities. In 1897 he entered journalism as managing editor of the *Independent*, and from 1913 to 1921 edited and owned that periodical. He became associated with a number of international societies and as an advocate of world peace lectured on that subject throughout the country. He represented the League to Enforce Peace at the Versailles Peace Conference in 1919. He also became of note as an advocate of simplified spelling, municipal government reform, and of improved social and labor conditions.

HOLT, HENRY (1840), publisher and author; *b.* Baltimore, Md. After graduating from Yale and Columbia Universities .1863-4) he entered the publishing business of G. P. Putnam and in 1873 established the publishing firm of Henry Holt & Co., New York City. He also edited the *Unpartisan* (formerly the *Unpopular*) Review and published works on man and nature, the cosmos and immortality, and on social and literary subjects. He also translated Edmond About's *Notary's Nose* from the French.

HOLT, LUTHER EMMETT (1855-1924), physician; *b.* Webster, N. Y. He graduated from the Columbia College of Physicians and Surgeons in 1880. From 1890 to 1901 he was professor of diseases of children of the New York Polyclinic, and thereafter at the College of Physicians and Surgeons. He became also physician-in-chief to the New York Foundling Hospital and the Babies' Hospital and a leading official of the Rockefeller Institute for Medical Research. His contributions to medical literature relate to the health and care of infants.

HOLT, WINIFRED, American sculptor and philanthropist. Was educated privately and studied anatomy, drawing and sculpture in Florence, Italy. Later she exhibited at New York, Florence and Berlin, her chief works being portraits, busts and bas reliefs. Becoming interested in befriending the sightless, she founded the New York Association for the Blind, promoted the establishment of a number of branches of that body, and organized similar societies in France in connection with aiding the World War blind. She lectured also in the United States and Canada on the work of blind soldiers. Much of her writings relate to the blind, and include a biography of Henry Fawcett, the blind Postmaster General of England. In 1923 she was married to J. C. Bloodgood.

HOLY ALLIANCE, THE (1815), a sort of treaty drwan up by the Emperor Alexander I. of Russia, in which he, the Austrian emperor, and king of Prussia, agreed to govern their dominions on principles of 'Justice, Christian Charity and Peace.' Though Alexander's intentions were good the H. A. came to stand for reactionary principles in Europe.

HOLY CROSS, COLLEGE OF THE, a Roman Catholic institution of higher learning situated at Worcester, Mass. It was established in 1843 and is controlled by the Society of Jesus. The system of education conforms to that followed in all Jesuit colleges and includes preparatory and collegiate departments. It is the oldest Catholic College in New Eng-

land. In 1922 there were 750 students and 30 teachers, under the direction of the Trustees.

HOLY CROSS MOUNTAIN, a peak, 14,000 ft. in height, of the Saguache range and branch of the Rockies, Colorado, U. S. A., in Eagle co., 15 m. N.W. of Leadville. Its name is taken from two huge snow-filled ravines which have the appearance of a cross.

HOLY GHOST. See HOLY SPIRIT.

HOLY GRAIL. See GRAIL, THE HOLY.

HOLY ISLAND, LINDISFARNE (55° 42′ N., 1° 48′ W.), island, off Northumberland, England; connected with mainland at low tide by sandy tract; has ruined Benedictine monastery. Pop. 650.

HOLY LAND. See PALESTINE.

HOLY ROMAN EMPIRE. See EMPIRE, HOLY ROMAN.

HOLY SEPULCHRE, KNIGHTS OF THE. See under HOSPITALLERS.

HOLY WATER. In Early Church running water was used for baptism, and was not specially consecrated. Water in baptism not only symbolised purity, but carried away sin. The h. w. now used in churches is consecrated in various rites. For royal or special baptisms water from the Jordan is used.

HOLY WEEK, week before Easter, observed in the churches by special religious exercises.

HOLYHEAD (53° 18′ N., 4° 39′ W.), port, Holy Isle, Anglesey, N. Wales; fine harbor; old church. Pop. 10,638.

HOLYOAKE, GEORGE JACOB (1817-1906), Eng. journalist and pioneer of the Co-operative movement in England; named his views 'secularism.'

HOLYOKE, a city of Massachusetts, in Hampden co. It is on the Boston and Maine and the New York, New Haven and Hartford railroads, and on the Connecticut river. Excellent water power is furnished from the river which is dammed with a dam 1000 feet in length. Holyoke is a city of great industrial importance and is the leading paper manufacturing locality in the world. It has a daily output of over 200 tons. Its other industries include the manufacture of cotton and woolen goods, machinery, turbines, thread, knit goods, steam engines and wire. The city has many important buildings, public schools, a high school and a library. It is connected by electric railway with neighboring towns and cities. Pop. 1920, 60,203.

HOLYOKE, MOUNT, an elevation in Hampshire co., Mass., between Hadley and Amherst on the north and South Hadley and Granby on the south. It is two miles east of the Connecticut River. Its formation is green stone, and its highest elevation is 1,120 feet above sea level.

HOLYROOD, royal palace, Edinburgh; founded 1128, by David I., as an abbey; palace foundations laid, *c.* 1501; sacked by English, 1544 and 1650; rebuilt by Charles II., 1671-79.

HOLYSTONE, piece of stone used for scrubbing the decks of ships; so called because its use demands a kneeling attitude.

HOLYWELL, (53° 17′ N., 3° 13′ W.), town, Flintshire, Wales; above St. Winifred's well is Perpendicular chapel. Pop. 2549.

HOLYWOOD (54° 38′ N., 5° 50′ W.), port, County Down, Ireland; site of former monastery.

HOLZMINDEN (51° 50′ N., 9° 25′ E.), town, Brunswick, Germany. Pop. 10,250.

HOMAGE, term used under the feudal system for formal acknowledgement made by tenant that military service was due from him for the lands into which he was entering; the tenant knelt, placed his hands between the lord's hands, and swore fealty.

HOMBURG-VOR-DER-HÖHE (50° 14′ N., 8° 36′ E.), town, Hesse-Nassau, Germany; noted watering-place; has saline and chalybeate springs; in vicinity is Saalburg. Pop. 15,000.

HOME ECONOMICS. Owing to the great increase in the cost of household necessities during recent years, much attention has been given to intelligent and systematic control over the expenditure of the family income. Various systems of household bookkeepjng have been devised, and although these differ in details, the underlying purpose of all of them is to draw attention to expenditure on individual items, in order that extravagance may be corrected, a better balanced expenditure devised, and a saving effected. To assist the would-be home economist, many specimen budgets have been drawn up, indicating in what manner the family income should be apportioned. These budgets must necessarily vary with conditions. The expenditure of the city worker on rent, lunches and carfare will obviously be

greater than the dweller in a small town, while the item for food will be less for the farmer than for the rest of the community. As a general guide, however, these specimen budgets have value. One commonly given for a moderate income divides the expenditure as follows: Food, 25 per cent., rent 20 per cent., clothes 20 per cent., operating 15 per cent., higher life 20 per cent. The last item includes education, amusement, savings, books and charity. Under operating expenses are included rent, repairs, fire insurance, railroad and carfare, heat, light, water, furniture and supplies, laundry, labor, telephone, interest, taxes and doctor. It is obvious that the percentage expenditure will vary with different incomes. The item for food, for instance, for a $1000 income will probably reach at least 30 per cent. while for a $5000 income it may drop to 15 per cent. Similarly, a saving of 10 per cent. on a $1000 year income is high, while on a $5000 it should approximate 25 per cent. It is sometimes recommended that the head of the family should draw up a reasonable budget in detail for his own use, and then by comparing his actual expenditure, item by item, he can reduce expenditure whenever it appears excessive.

HOME, JOHN (1722-1808), Scot, dramatic poet; *b.* Leith; *ed.* for Church; officiated in E. Lothian; his famous play, *Douglas*, was produced in Edinburgh (1756), with great success, and was seen at Covent Garden in the year following; later became Secy. to Lord Bute, and subsequently tutor to Prince of Wales (George III.)

HOME OFFICE, department of Brit. government; at head of Home Sec., under whom are parliamentary and permanent under-sec., two permanent assistant under-sec's (one of whom is a barrister), numbers of clerks, inspectors, of factories, prisons, etc. Sec. of State for Home Department maintains law and order in England and Wales, controls prisons, administers Labor Acts, Licensing Acts, Vivisection Act, Cruelty to Animals Act, etc.

HOLY SPIRIT, THE, or **HOLY GHOST**, or **PARACLETE**, in orrhodox Christian theology, the Third Person in the Blessed Trinity. Foreshadowings of the Christian doctrine are foind in certain parts of the O.T. writings, as, for instance, in Gen. 1. 2, 1 Sam. xvi. 13, and Joel ii. 28 ff., quoted as a prophecy of the descent of the Holy Spirit at Pentecost in Acts ii. 17 ff. It becomes much clearer, however, in the N.T., where the Holy Spirit is spoken of in a way that makes His Divinity distinct in such passages as 2 Cor. iii, 16 ff., 2 Tim. iii. 16., Gal. v. 22, etc. From other pasasges still more may be gathered. Matthew xxviii. 19, 1 Pet. i. 1-14, speak of the Holy Spirit as distinct from the Father and the Son, while His Personality is insisted on in the important passage beginning John xiv. 16, as also in John xv. 26, 'But when the Comforter is come whom I will send unto you from the Father, even the Spirit of truth, which proceedeth from the Father. He shall testify of me.' In this text we have also a reference to the question of the Procession of hte Holy Ghost, which caused such serious misunderstandings between the Eastern and Western churches in later centuries. The Easterns condemned the churches of the West for the addition of the Filioque clause in the Nicene Creed, and they further denied that the procession of the Holy Spirit was 'from the Father and the Son.' It must be pointed out, however, that there is probably no real doctrinal difference involved, as the West has never held that this rather unfortunate addition to the Oecumenical Creed teaches a Dual Procession, but rather a procession *from* the Father *through* the Son. This doctrine Eastern theologians would endorse. Many questions relating to the Holy Spirit are bound up with the controversies as to the Holy Trinity which occupied the mind of the Church in post-Nicene times. The most important results, embodied in the Athanasian Creed, and the additions to the Nicene Creed, lay stress on the *personality* of the Holy Spirit.

HOME RULE, term invented by Isaac Butt in 1873 to indicate Irish demand for self-government. For history, see IRELAND. The form of self-government advocated by the Earl of Dunraven in 1905 was known as Devolution, which he thus propounded; 'One Parliament is my centre, its ultimate effective supremacy is my circumference, but emanating from that centre and within that circumscribing limit I desire to see the largest possible freedom of action and self-government relegated to Ireland.' At the present time there is a strong devolutionary movement in Scotland, and to a lesser extent in Wales.

HOMEL, Gomel (52° 26′ N., 30° 52′ E.), town, Mogilev, Russia. Pop. 80,-900.

HOMER, greatest epic poet; *b.* between 1100-900 B. C., in Greece; exact birthplace uncertain, traditionally Chios; known by his poems, the *Iliad* and the *Odyssey*, which were originally ascribed to him but are almost certainly of different authorship. From internal evidence it is calculated that about a cen.

tury separates the poems. They existed before the introduction of writing, and were handed down by word of mouth by the *rhapsodists*, who some times perverted the order of lines or interpolated passages of their own composition. Many poems are ascribed to H., the *Homeric Hymns*, the *Thebaid*, etc., but they are of different authorship though roughly contemporaneous. His writings correspond with the Mycenean and Cretan civilisations; his style is graphic and picturesque, abounding in similes; the vocabulary is large and contains many *hapax legomena*. The *Odyssey* and *Iliad* were recited at many Gk. festivals and were taught in schools; served as model for Vergil and Apollonius of Rhodes. See also GREECE (LITERATURE).

HOMER, LOUISE (1872), operatic vocalist; *b.* Pittsburgh, Pa., as Louise Dilworth Beatty; married Sidney Homer under whom she studied singing. In 1898 she made her debut at Vichy as Lenora in La Favorita, after studying her art under Mme. Koenig, in Paris. She next appeared at Covent Garden, London, and at the Metropolitan Opera House, New York City, where she became a great favorite of opera lovers. She sang also in concerts, and made frequent tours in the United States.

HOMER, WINSLOW (1836-1910), an American painter, *b.* in Boston, Mass. He began his art studies in the studio of Frederic Randel, president of the National Academy of Design. During the Civil War he was sent to the front by *Harper's Weekly* to make sketches. His first painting, 'Prisoners from the Front,' was exhibited in 1864 and immediately gave him a high standing. His later subjects were chosen from among the fisher folk of the Maine coast and other parts of New England, among these being 'The Life Line' 1884, and 'The Lookout,' 1897. His finest painting is considered a marine, 'On the Maine Coast.'

HOMESTEAD, a borough of Pennsylvania, in Allegheny co. It is on the Pennsylvania, the Pittsburg and Lake Erie, Bessemer and Lake Erie and other railroads, 10 miles southeast of Pittsburgh. It is one of the chief steel manufacturing cities in the country and is the seat of the steel works established by Andrew Carnegie, afterwards sold to the United States Steel Corporation. Its other industries include glass works and machine shops. The labor troubles in 1892 culminated on July 6 of that year in a serious riot which was provoked by the attempt to intimidate the strikers by Pinkerton detectives. The riot was finally subdued by the State militia, after several persons had been killed. Pop. 1920, 20,452.

HOMESTEAD LAWS are statutes formally in force in America, whereby a settler may establish right to his dwelling. By an Act passed in 1862 any Amer. citizen of twenty-one years of age may claim 160 acres of public land; this he receives on condition of his settling there for five years, after which time he receives a title to it from government. The homestead is also protected by law from seizure by creditors. Similar laws obtain in various Brit. colonies.

HOMEYER, CARL GUSTAV (1795-1874), Ger. jurist and antiquarian.

HOMICIDE. See MURDER, INSANITY.

HOMILETICS (Gk. *homilein*, to gather together), science of preaching as branch of rhetoric.

HOMILY, a religious composition simpler than a sermon. Justin Martyr says that after the reading of Scripture the minister exhorted the people. Preaching has sometimes been subordinate, *e.g.* in the Middle Ages and in some Catholic countries now. An Anglican clergyman may read one of the Homilies in the Prayer Book instead of his own sermon, a practice now obsolete.

HOMŒOPATHY, system of therapeutics, founded by S. C. F. Hahnemann (1755-1843), a Ger. physician, the main theory of which is that a disease is cured by drugs which produce in a healthy person similar symptoms to those of the disease, the therapeutic effect of any drug being ascertained or 'proved' by administering it to healthy persons in gradually increasing doses. In regard to the dose of a drug which should be given in homoeopathic treatment opinions differ; but most homoeopathists are agreed that small doses are necessary, while the drugs should be administered in the same form as when it was 'proved.' Hahnemann also promulgated a theory that all chronic diseases were due, directly or indirectly, to psora (itch), syphilis, or sycosos (fig-warts) —a theory which has been entirely disproved with the advance of the science of medicine, but which has had the unforunate effect of assisting the opponents of homoeopathy to ridicule the main theory of the system, with which it has really no connection. Considerable success has attended the introduction of homoeopathic methods of treatment, and according to its advocates, the development of serum therapy (*e.g.* in diphtheria, tetanus, plague) bears out the truth of the fundamental theory. In

addition, it has had a great share in influencing the diminution of the quantity of drugs considered necessary for the treatment of disease, while is has also stimulated the study of the action oad effects of drugs.

The opposition with which homoeopathy was received by the medical profession in Britain has of late become come somewhat lessened, and in addition to the London Homoeopathic Hospital, founded 1850, there are a number of similar hospitals and dispensaries in provincial towns. The barriers between homoeopathy and more orthodox medical treatment have, with the modern development of therapeutics, been largely broken down. In America, the theory is taught in many medical schools and universities. There are a great number of homoeopathic hospitals and journals, and a large proportion of medical practitioners work in accordance with its principles.

HOMOPTERA, the name given to one of the two sub-orders of Hemiptera whose members differ from those of the Heteroptera in that their wings cover the abdomen in a roof-like manner. Tho basal and apical parts of the wings are generally of the same consistency, and sometimes all four wings are transparent; the head is furnished with three ocelli, placed trianguiarly on the summit, and the front of the head is bent over, touching the coxae. This sub-order includes the Cicadidae, Fulgaridae, Membracidae, Cercopidae, Jassidae, Psyllidae, Aphidae, Aleurodidae, and Coccidae.

HOMS, HEMS, HUMS (34° 46′ N., 36° 46′ E.), walled town, Syria; formerly site of famous temple of the sun; produces silk. Pop. *c.* 60,000.

HO-NAN (34° N., 113° E.), province, Central China; area 67,940 sq. miles; mountainous in W.; drained by Hoang-ho and affluents of Han-kiang. Pop. *c.* 35,316,800.

HONAWAR, ONORE (14° 17′ N., 74° 27′ E.) port, Bombay, Brit. India. Pop. *c.* 7,000.

HONDA, SAN BARTOLOMEO DE HONDA (5° 12′ N., 74° 50′ W.), town, Colombia, S. America. Pop. *c.* 7,000.

HONDECOETER, MELCHIOR D′ (*c.* 1636-95), Dutch painter of birds; belonged to a family of painters, being s. of Gisbert and Grandson of Gillis d′H., both painters.

HONDO. See JAPAN.

HONDURAS, republic in Central America (14° 42′ N., 86° W.), bounded N. by Caribbean Sea; E. and S. Nicaragua; S., Pacific and Salvador; and W. Guatemala; coast-line *c.* 400 m.; cap. Tegucigalpa. Surface excepting narrow strip of swamp-land on the coast, is mountainous, traversed by continuation of Nicaraguan Cordillera, and forming elevated tableland with fertile plains and valleys, and rising in mountain ridges—highest point being Montaña de Salaque (*c.* 10,120 ft.); many streams, including Segovia (*c.* 350 m.) and Ulua; only large lake is Yojoa. Climate is healthy in highlands, but oppressive in lowlands. Honduras is rich in minerals —platinum, silver, iron, etc.; bananas, coco-nuts, coffee, tobacco, and rubber are produced, sarsaparilla is exported; industries are cattle breeding and straw plaiting for hats; important towns include Jutigalpa, Comayagua, and Amalpa. Area, 44,275 sq. m.; pop. 553,400.

History.. Honduras was discovered by Columbus 1502; became independent 1839; revolution 1910-11.

Government. The president is elected for four years; Congress, one house, has 42 deputies elected for four years. See under CENTRAL AMERICA.

HONDURAS, BRITISH, a British crown colony; w. side of Gulf of Honduras, in w. of Caribbean Sea (18° N., 88° 20′ W.), bounded N. by Yucatan province of Mexico, W. by Guatamala. It produces cedar, mahogany, rosewood, logwood, sugar, coffee, sarsaparilla, fruits, tortoise-shell, most of which are exported; imports cotton, yarn, cloth, hardware, general goods. Climate is moist and hot, and unsuited to Europeans. Colony is administered by lieut. governor, assisted by executive and legislative councils. Inhabitants include Europeans, Indians, mixed races, Early Brit. settlers had considerable trouble with Spaniards, who made various attempts to oust them, but were ultimately frustrated. Honduras became independent 1839; Britain's claims were finally confirmed in 1859. Belize, the cap., on good harbor, does large export trade. Area, 8,598 sq. m. Pop. 42,300. See under CENTRAL AMERICA.

HONDURAS, GULF OR BAY OF, the broad basin of the Caribbean Sea, skirting Honduras, Guatemala, and British Honduras in Central America.

HONE, a variety of hard, slaty stone, close grained, containing tiny particles of quartz or silica and used on the decks of ships.

HONEY, a sweet liquid collected by bees and other insects from the nectaries of flowers; composed chiefly of various sugars (glucose and possibly cane

HOOKAH, large tobacco pipe much used in Turkey, Persia, and other Eastern countries; the stem passes through two bowls, the lower containing water, which absorbs harmful ingredients of the smoke.

HOOKE, ROBERT (1635-1703), Eng. scientist; educated at Oxford; surveyor of London during rebuilding after Great Fire of 1666; invented anchor escapement of clocks and spring-balance wheel of watches; sec. of Royal Soc., 1677-82.

HOOKER, ISABEL BEECHER (182 - 1907), an American writer; *b.* in Litchfield, Conn., and the *d.* of Dr. Lyman Beecher. She was one of the first agitators for women's suffrage in this country and as such appeared frequently on the lecture platform. Among her writings, most of which are on the subject, is *Womanhood, its Sanctities and Fidelities.*

HOOKER, JOSEPH (1814-1879), an American soldier, *b.* in Hadley, Mass. He graduated from the military academy at West Point in 1837, and served with distinction during the Mexican War, but in 1853 he resigned, following the vocations of farmer and engineer at various times. When the Civil War broke out he immediately offered his services to the Federal Government and was sent to the front with the rank of brigadier-general He served so well during the various battles in which he participated that he was made a major-general in 1862, and as such commanded at the battle of Fredericksburg. In 1863 he was given command of the Army of the Potomac, but here showed a decided lack of administrative ability, so that he was again sent into the field of active fighting. At the battle of Chancellorsville he made so poor a showing, the Federal defeat there being attributed to his poor judgment by his superiors, and so strong was the public feeling against him that he resigned. He was then given command of the 11th and 12th corps, and given the opportunity to retrieve himself, at the Battle of Lookout Mountain, near Chattanooga, which he did so brilliantly that he has ever since been regarded as one of the great military leaders of the Civil War. In 1865 he was breveted a major-general of the regular U. S. Army.

HOOKER, RICHARD (1553-1660), Eng. theologian; *b.* Heavitree, Devon; ed. Oxford; took orders and received the living of Drayton-Beauchamps (Bucks); was appointed Master of the Temple, 1585; and subsequently held livings at Boscombe (Wilts) and Bishopsbourne (Kent). *The Four Books of the Lawes of Ecclesiastical Polity* was pub. 1594; the fifth book in 1597; and subsequent books were pub. after his death.

HOOKER, SIR JOSEPH DALTON (1817-1911), Eng. botanist and traveller, succ. his *f.* as director of Kew Botanical Gardens, 1865; pub. *Genera Plantarum* and a *Flora of the British Isles*; O.M., 1907; a friend of Darwin.

HOOKER, MOUNT, a mountain in the Rocky Mountain system in Canada, on the east boundary of British Columbia. It is 15,690 feet high.

HOOKER, THOMAS (1586-1647), Puritan theologian; lectured in Leicestershire; emigrated to Massachusetts, 1633; helped to found Hartford, Conn., 1636; wrote *The Soule's Humiliation.*

HOOKWORM DISEASE. Also known as *Ankylostomiasis, uncinariasis, miner's anaemia, tunnel disease,* etc. A disease prevalent in hot climates, especially in the south eastern portion of the United States, West Indies, and Central and South America. It is caused by a parasitic worm, known as *ankylostomum duodenale,* which lodges in the intestines. The worms, of which there may be any number from a few up to many thousands in the intestines, are from 1-60 to 1-25 inch in length, and almost cylindrical. The disease has probably existed from time immemorial, but the worm was first discovered by Dubini in 1838. In the years 1853 to 1854, Bilharz and Griesinger definitely connected the symptoms of the disease with the presence of the worms in the body, but it is only during recent years that the wide prevalence of the disease in the United States has been realised and its causes and treatment fully understood. The early symptoms are caused by the passage of the larvae through the skin. This produces irritation followed by burning, inflammation, blisters and finally pustules. The pustules form scabs, which fall off, leaving sores. The sores heal in about two weeks and the patient then appears to recover almost completely. In another six to eight weeks, however, the later symptoms, due to the development of the worms in the intestines, appear. There is general weakness and languor, pallor, pains in the upper abdomen, indigestion and sometimes constipation. In severe cases death may ensue. The disease attacks children very readily, sometimes with tragic results. The child's bodily and mental development may be retarded to such a degree as to leave him permanently stunted and mentally deficient. The disease, however, responds readily to treatment, especially in the early stages. The expulsion of the parasites

is followed by slow but almost certain recovery. The day previous to the treatment the patient fasts after the mid-day meal, and is given a strong purgative upon retiring, followed, if necessary, by a dose of laxative salts the next morning. After the bowels have acted, an anthelmintic is administered. The two most effective are oil of chenopodium (either with or without chloroform) and thymol. As the latter drug is a poison, care must be used in its administration.. The drugs are given in two doses, one hour apart followed by a further dose of laxative. The patient should remain in bed, and no food should be taken until the evening meal.

HOOLIGAN, term applied in latter part of XIX. cent. to London street ruffians of criminal class. The earlier 'garrotters' were of a more brutal type, who half-strangled their victims from behind and rifled their pockets. The 'Mohocks' of the XVIII. cent., referred to in the *Spectator*, belonged to a better class, and though violence was often used, it was chiefly with humorous intent.

HOOPER, JOHN (*c.* 1495-1555), Prot. martyr; went to Switzerland during last reactionary years of Henry VIII. reforming preacher under Edward VII; chaplain to Protector Somerset; bp. of Gloucester, 1550; objected to priestly vestments; bp. of Worcester *in commendam*, 1552; imprisoned on Mary's accession, 1553; burned at Gloucester, 1555; called 'Father of Nonconformity.'

HOOPOES (UPUPA), so called from their call; form a genus and family of picarian birds widely distributed in desert regions of Europe, Asia, and Africa. One species (*U. epops*), with long slender bill, crested head, and orange-brown plumage marked by black and white bars, is an occasional migrant to Britain.

HOORN.—(1) (52° 36′ N., 5° 4′ E.), town, N. Holland; trades in cattle and dairy produce; has interesting XVI.- and XVII.-cent. buildings. Pop. 11,000. (2) (53° 24′ N., 5° 20′ E.), town, Friesland, Holland.

HOOPING-COUGH. See WHOOPING COUGH.

HOOSAC MOUNTAINS, a range of mountains, part of the Green Mountain Range, in western Massachusetts.

HOOSAC TUNNEL. a famous tunnel through the Hoosac Mountains, in western Massachusetts. It is about 5 miles long and was begun in 1851 for the purpose of shortening the railroad distance between Boston and Albany. It was finally opened in 1875. Its total cost is about $18,000,000.

HOOSICK FALLS, a village of New York, in Rensselaer co., 25 miles N.E. of Troy. Its industries include the manufacture of mowing machines, reapers, woolen goods, iron and paper machinery. Pop. about 5,000.

HOOVER, HERBERT CLARK (1874) American engineer and cabinet officer; *b.* West Branch, Ohio. He graduated at Stanford University, Cal., in 1895, took part in geological surveys during his college vacations and in 1896 became manager of mines in New Mexico and California. He went to West Australia in 1897 as chief of the mining staff of an Australian corporation. Two years later he was chief engineer of the Chinese Imperial Bureau of Mines. He participated in American operations during the Boxer Rebellion of 1900. From that period until 1914 he was engaged actively in important mining operations. During the World War he was chairman of the American Relief Committee in London and Belgium, 1915-16; and in 1917 was made Food Administrator of the United States by President Wilson. In that office he gained a national reputation, and, following the close of the war, made a remarkable record in feeding the inhabitants of destitute regions in Poland, Austria and other impoverished sections of Europe. His name was prominently mentioned as a candidate for the presidential nomination at the Republican National Convention in 1920. He became Secretary of Commerce in the cabinet of President Harding in March of 1921. The administration of his department has been notable for economy and efficiency. He was an active factor in the American relief afforded the starving millions of Russia in 1922 and took an important part in the guarding of the commercial interests of United States business men in 1923.

HOP is a twining plant, *Humulus lupulus*, natural order *Cannabineae*, which twines in the direction of the hands of a watch (right-handed spiral). It is a perennial plant with opposite lobate leaves, and grows wild in hedges and upon river-banks. The hop is *dioecious*. The male flowers are small and terminal and borne in the axils of leaves, the floral envelope has five segments and there are five *stamens*: the female flowers are cone-like in arrangement. Each has a tubular floral envelope and is invested by a *bracteole*. The cone is made up of a series of *bracts* with two female flowers at the base of the upper surface of each. The *bracts* are mem-

branous and covered with *glands* which secrete an oil which keeps off insects. Flowers are pollinated by the wind (*anemophilous*). The fruit is composite and is called a *Strobilus*.

HOPE, ANTHONY. See HAWKINS, ANTHONY HOPE.

HOPI, MOKI, tribe of N. Amer. Indians inhabiting S.W. of U. S. A.

HÖPKEN, ANDERS JOHAN, COUNT VON (1712-89), Swed. statesman; leader of the Hats; noted for classical style of speeches.

HOPKINS, ESEK (1718-1802), an American naval officer, *b.* in Scituate, R.I.; appointed by Congress, 1775; First Commander-in-Chief of American navy with title of Admiral. He was dismissed for allowing the 'Glasgow' to escape.

HOPKINS, JOHNS (1795-1873), an American capitalist and philanthropist, *b.* in Arundel County, Md. His father was a Quaker farmer, and until he was 17 the son remained at home, helping with the farm work. He then went to Baltimore and from a boy in a grocery store, worked his way up to success as the head of a large wholesale grocery firm, retiring in 1847 with a large fortune. He gave over $4,000,000 toward the establishment of a free hospital, and in his will left $3,000,000 for the establishment of the Johns Hopkins University.

HOPKINS, MARK (1802-1887), an American College president, *b.* in Stockbridge, Mass. He graduated from Williams College, in 1824, studied medicine and began practice in New York City, in 1828, but returned to Williams College two years later as professor of philosophy and rhetoric. In 1836 he became president, and as such showed such ability that within a few years he had raised the institution to the status of one of the best colleges in the country. He wrote *An Outline Study of Man*, 1873; *The Scriptural Idea of Man*, 1883; and *Teachings and Counsels*, 1884.

HOPKINS, SAMUEL (1721-1803), Amer. theologian; ordained 1743; made attack on slavery, arousing much opposition; wrote *Life of Jonathan Edwards* and various theological works.

HOPKINS, STEPHEN (1707-1785), an American statesman. *b.* in Providence, R.I. He was appointed chief justice of the Superior Court of Rhode Island in 1751, and in 1756 was elected governor of the province. He was a member of the Continental Congress and a signer of the Declaration of Independence.

HOPKINSON, FRANCIS (1737-91), Amer. politician and writer; delegate at Continental Congress, 1776,1777; signed Declaration of Independence; wrote *The Political Catechism, a Prophecy.*

HOPKINSVILLE, a city of Kentucky, in Christian co., of which it is the county seat. It is on the Louisville and Nashville, the Tennessee Central, and the Illinois Central railroads, 73 miles N.W. of Nashville, Tenn. Its industries include the manufacture of tobacco, lime, brick, wagons and carriages. It is the seat of several educational institutions including McLean College and Bethel Female and Southern Kentucky College. It is the seat also of the Western Kentucky Insane Asylum. It has a public library, a national bank and a high school. Pop. 1920, 9,696.

HOPPER (WILLIAM) DE WOLF (1853), an American comedian, *b.* in New York City. He was educated in J. H. Morse's School, and in 1879 made his first appearance in *Our Boys*. Later he joined Daniel Frohman's Madison Square Company, where he appeared as Pittacus Green in *Hazel Kirke*. After a course in voice culture and music he joined the McCaull Opera Co., then starred at the head of his own company. He is most popularly known for his appearances in the Gilbert and Sullivan operas. especially in the roles of Bunthorne, in *Patience* and Dick Deadeye in *Pinafore*. In 1921, he appeared in *Ermine* with Francis Wilson.

HOPPNER, JOHN (1758-1810), Eng. artist; distinguished for brilliant coloring; painted 'a Sleeping Nymph' and other classic subjects, but excelled in portraiture; a follower of Reynolds, and a rival of Lawrence.

HOPTON, RALPH, BARON HOPTON (1598-1652), Eng. Royalist in Civil War; gained Cornwall for king; won battle of Stratton, 1643.

HOQUIAM, a city of Washington, in Chehalis co. It is on the Chicago, Milwaukee and St. Paul, the Northern Pacific, and the Oregon Washington and Navigation Co. railroads, and on Gray's Harbor. It has considerable commercial importance as it has an excellent harbor. It it also the center of an important lumbering region. Its industries include shipyards and lumber and shingle mills. There is a Carnegie library and a high school. Pop. 1920, 10,058.

HORACE, QUINTUS HORATIUS FLACCUS (65-8 B.C.), Rom. poet; *b.* at Venusia, in Apulia; his father, of the freedman class, contrived to have him educated at the same schools as the sons

of senators and magnates at Rome and at Athens. At Athens N. joined the forces of Brutus, and served in Philippi as tribune. His depreciation of his valour is an imitation of Archilochus and Alcaeus, and does not imply real cowardice. His homestead appears to have been twice confiscated, but his patron Maecenas stood by him in his time of trouble and bestowed on him the beloved Sabine farm. In 37 B.C., H. with Maecenas, Vergil, and others, made the famous journey to Brundisium (*Sat.* i. 5). When Vergil died (19 B.C.) Horace became chief court poet and voiced the ideals of Augustus.

His *Satires* are not vindictive in tone; they employ ridicule and not invective. The *Epistles* in tone are not unlike the moral essays of Pope. The *Epodes* sre less delicate in sentiment,less restrained in passion. The *Ars Poetica* and the 2nd book of the *Epistles* are poetic treatises of literary art and critisism. The *Odes*, his lyrical poems, are H.'s greatest work; they are not original in sentiment or passionate in feeling, but they are polished, chaste, and perfect in expression.

HORÆ (classical myth.), the 'Seasons'; three beautiful maidens, Eunomia, Dike, and Eirene, dau's of Zeus and Themis, who presided over spring, summer, and autumn, and, in a lesser degree, the hours. In the latter capacity it was their daily duty to harness the heavenly horses to the chariot of the Sun.

HORAPOLLON (fl. IV. cent. A.D.), Greek of Egypt to whom Gk. treatises on Egyptian hieroglyphics are ascribed.

HORATII, THE THREE, three Rom. bro's, who in legendary Rom. history met in battle three bro's called the Curiatii, of the Alban nation, to decide a national dispute. Two of the Horatii were slain, the third feigned flight, then turning, slew his foes one by one.

HORATIUS COCLES, hero of Rom. legend; said to have held the Tiber bridge single-handed against the Etruscans under Lars Porsena.

HOREB (28° 33′ N., 33° 56′ E.), mountain, Palestine; alternatively called Sinai (*q.v.*).

HOREHOUND (MARRUBIUM), genus of plants of order *Labiatoe*; White H. (*M. vulgare*) is used medicinally as tonic. laxative, and as sedative for coughs.

HORIZON, circle of which the centre is the person beholding,the circumference at the eyesight limit; the dip of the farther part of an object an the h. is one of proofs of spherical shape of earth.

HORMAYR, JOSEPH, BARON VON (1782-1848), Ger. historian and politician; conducted affairs during Tiroleso rebellion, 1809; Austrian imperial historiographer, 1816; afterwards entered Bavarian service. Wrote *Geschichte der Tirol.*

HORMISDAS, pope, 514-523, healed schism between Eastern and Western Churches.

HORMIZD, five Sassanid kings of Persia, of whom best known is Hormisd IV.; he became king, 578 A.D.; reformed army; warred against Romans and Turks; was deposed, 588, and slain, 590.

HORMUZ, OR ORMUZ (27° 3′ N., 56° 26′ E.), ancient and famous city on Persian Gulf; exact date of foundation unknown; occupied various sites during course of history. In XIII. cent. one of chief centres of trade with India; *c.* 1300, inhabitants forced to abandon city owing to Tartar raids, and settled on island of Jerun not far distant. Here fine fortified city was built; in XVI. cent. taken by Portuguese, but still of great commercial importance; Portuguese forced to surrender to Eng. a cent. later, and Persians transferred trade to Gombroon on mainland. Minaret, portion of mosque, and other traces of city still to be found on island.

HORN, ARVID BERNHARD, COUNT (1664-1742), Swed. politician; ambassador to Poland, 1704; secured Stanislaus I.'s election to Polish throne; premier, 1710; virtual ruler of Sweden, 1720-38; established new constitution.

HORN, KING, XIII.-cent. Eng. metrical romance. Horn, *s.* of an Eng. king, is set adrift at sea by pirates, lands in Cornwall, and after many vicissitudes marries the Cornish king's *d.*.

HORN, PHILIP DE MONTMORENCY, COUNT (1518-68), Dutch statesman who ,with William of Orange and Egmont, led the revolt of the Netherlands against Spain; executed at Alva's command.

HORNADAY, WILLIAM TEMPLE (1854), an American zoölogist, *b.* in Plainfield, Ind. He graduated from the Iowa State Agricultural College, then continued his studies in zoology at home and abroad. During 1875-9 he visited Cuba, Florida, the West Indies, South America, India, Ceylon, the Malay Peninsula and Borneo as a collecting zoölogist. For a while he was in the real estate business in Buffalo, N. Y., but since 1896 he has been director of the New York Zoölogical Park. He has been especially prominent in the movement for the protection of game and

birds. He has written *Two Years in the Jungle*, 1885; *Camp Fires in the Canadian Rockies*, 1906; *Conservation in Theory and Practice*, 1914; *Awake, America*, 1918; *The Lying Lure of Bolshevism*, 1919; and *Old Fashioned Verses*, 1919.

HORNBEAM is a genus of trees, natural order *Cupuliferoe*, cohort *Fagales*, flowers resemble those of hazel, but the male *catkins* have no *bracteoles*

HORNBILLS (BUCEROTIDOE), so called on account of their large, hollow, horney beaks; a family of picarian birds confined to Africa from the Sudan southwards, South-Eastern Asia, and the neighboring islands. While sitting on her eggs the female is built into the tree-hollow by a mud wall, the male feeding her until the young are hatched; arboreal and terrestrial, feeding on seeds, insects, and even reptiles.

HORNBLENDE. See AMPHIBOLE.

HORN-BOOK, article once used in elementary education, consisting of a sheet of paper bearing the alphabet, Lord's Prayer, etc., placed between a flat piece of wood, with handle, and a thin sheet of horn.

HORNE, RICHARD HENGIST (1803-84), Eng. poet and critic; pub. *Orion*, 1843, an epic poem; *Death of Marlowe, Cosmo de Medici* (tragedies); and *A New Spirit of the Age* (criticism).

HORNE, RT. HON. SIR ROBERT STEVENSON (1871), Brit. statesman of Scot. birth, had brilliant career at Glasgow Univ., and was called to bar, 1896; was Conservative candidate for Stirlingshire (Jan. and Dec. 1910). During World War he did valuable work as assistant inspector-general of transportation, 1917; director of Admiralty Labor department, 1918; entered Parliament as Coalition Unionist member for Hillhead div. of Glasgow, 1918; minister of labor, 1919-20. In March 1920 he succeeded Sir Auckland Geddes at the Board of Trade, and retained this office until the conservative victory of October, 1922; privy councillor, 1919.

HORNE, THOMAS HARTWELL (1780-1862), Eng. theologian and scholar; pub. *Critical Study of the Holy Scriptures, Introduction to the Study of Bibliography*; long connected with Brit. Museum.

HORNED OWL. See OWL FAMILY.

HORNED TOAD, the popular name given to the species of *Ceratophrys*, a genus of amphibians, belonging to the order Anura and the family Cystignathidae. The name is derived from the triangular, upright, horny appendage above each eye. The head and mouth are huge, and the general appearance is toad-like. *C. cornuta* of N. Brazil is beautifully colored, as also is *C. ornata*, a species found in Uruguay, Paraguay, and N. Argentina.

HORNELL, a city of New York, in Steuben co. It is on the Pittsburgh Shawmut and Northern, and the Erie railroads, and on Canisto river, 60 miles S. of Rochester. It is an important industrial community and has manufactures of satchels, doors, blinds, furniture, carriages, brick and tile, gloves, and machinery. It is the seat of a free academy and of Mercy Hospital. It has a public library, national banks, etc. Pop. 1920, 15,025.

HORNEMANN, FREDERICK (fl. 1800), Ger. explorer; carried out explorations in Africa for London African Association between 1797 and 1799.

HORNET (VESPA CRABRO), reddish-brown wasp; eats fruit, insects, etc.; American variety is Whitefaced H. (*V. msculata*).

HORNFELS (plural, hornfelses), a rock found in diabases, basalts, and other igneous rocks, composed of felspar, hornblende, and pyroxene; of tough, durable composition, also hard and brittle; color, dark brown and black; generally contains numerous small bright crystals of black mica.

HORNPIPE, lively dance, popular amongst sailors; so called because originally accompanied on a reed pipe having horn fittings at either end.

HORNSEY (51° 35′ N.; 0° 6′ W.), borough, suburb of London, Middlesex, England. Pop. 1921, 87,691.

HORNUNG, ERNEST WILLIAM (1866-1921), Eng. novelist and journalist; spent 1884-6 in Australia, and has been engaged in literary work ever since; the years spent in Australia colored much of his work, as in *A Bride from the Bush*, 1890; *The Boss of Taroomba*, 1894; is probably best known as the creator of *Raffles* and tales of a similar type.

HOROLOGY, science of measuring time. See CLOCK, TIME, CHRONOLOGY.

HOROSCOPE, signs of the heavens at person's birth; in 'casting' the h. astrologers made diagram of 12 houses, or zodiac signs. See ASTROLOGY.

HORROCKS, JEREMIAH (1619-41), Eng. astronomer; first to show how moon follows Kepler's laws, and to account for its irregularities; revised Kep-

ler's Rudolphine tables; predicted and first observed transit of *Venus*; first to make tidal observations.

HORSE FAMILY (*Equidae*), the most highly specialised family of odd-toed, hoofed (*Ungulate*) mammals, including horses, asses, and zebras as well as many extinct forms. The compact, clean-cut bodies long heads and tails, and maned necks of the horse and its relatives are familiar, but there are skeletal characters of more importance in separating it from its nearnest allies, the Tapirs and Rhinoceroses, and these mainly reside in the teeth and limbs. The skull is very long, the eye-socket is a closed ring, and the teeth number, at highest, 44, although the early disappearance of the first cheek-tooth on each leaves 42 as the usual number. The surfaces of the back teeth, obviously grinders, are thrown into complicated crescentic folds of hard enamel, with softer cement between; and the incisors are prominent and chisel-shaped, with a central pit lined by enamel—the 'mark' whose decrease in size indicates the age of its possessor. The limbs are furnished with one hoofed digit (the third), which is functional, but it is sometimes accompanied by the second and fourth, reduced to mere splint bones, or at any rate always functionles.

Horses in a general sense are found throughout the world, but the various wild species are confined in range and are found only in the Old World, especially in Asia and Eastern Africa. Semi-wild forms occur in Australia and America, but these are the descendants of domesticated horses which have escaped from captivity. in the latter country since the Spanish conquest. In nature horses are gregarious, living, in herds the movements of which are dominated by an experienced stallion or male, the female being known as mare, and the young as foal; but they are ever on the watch and habitually move against the wind so that they may receive early notice of the scent of an enemy. They are entirely vegetarian, feeding mainly on grass, but also on young shoots of trees and herbage.

To consider less generally the members of the horse family, all the living species of which belong to the noe genus *Equus*.

Heading the list on account of its familiarity and of its usefulness to man is the domestic Horse (*E. caballus*), representatives of which roamed the plains of Europe and Asia in freedom till about the end of the XVI. cent., although the horse as a domestic animal probably dates from prehistoric times. It is characterised by a hardened lump—the 'chestnut'—on the inner side of the legs above the hock, and by the fact that the hairs of the tail grow in a tassel from its base. During the ages of servitude to man many varieties of horses have been selected and bred for special purposes. Thus perhaps most useful are the heavy carthorses, distinguished by their weight of body and stoutness of limb, the best known being the Shire, Clydesdale, and Suffolk Punch. While bred for very special purposes necessitating cleanness and lightness of limb and body are the English Racers and American Trotters, differing in descent from the cart-horses, which are comparatively pure natives of Europe, by the interbreeding with such graceful African horses as the Arab.

Closely related to the domestic horse are the active Tarpans or Wild Horses of of the steppes, probably a decaying remnant of the original wild horses of Europe; and the small, shaggy, erect-maned Prejevalski's Horse of Central Asia.

The horse, as we know it, has been traced back to Pliocene times, but the remains of earlier forms have been discovered which seem to point to the ancestral line along which the modern horse developed. The differentiation appears to have followed these directions; an increase in size, a reduction in the number of functional digits, and an increasing complexity in the structure of the teeth. Thus the Eocene *Phenacodus*, at the source of the horse group, was an animal about the size of a bull-dog and had five functional toes on each foot; *Paloeotherium* and *Anchitherium*, the former from the later Eocene, the latter about the size of a sheep, had three digits, and link the tapir group to the horses, while in the Pliocene *Hippotherium*, as big as a donkey, the middle digit was already outstandingly developed.

HORSE-CHESTNUT OR ÆSCULUS HIPPOCASTANUM, a well-known species of Hippocastanaceae, commonly grown in Britain as an ornamental plant. It has large leaves divided into five or seven long, distinct leaflets, and the white flowers are arranged in tall spikes: the fruit is a prickly capsule.

HORSE-MACKEREL, the popular name of *Caranx*, a genus of teleostean fishes belonging to the sub-order Acanthopterygii and the family Carangidae. *C. trachurus*, is common on our coasts, where the young are often found in large colonies, sheltering under medusae. They have a compressed oblong body covered with small scales.

HORSENS (55° 52′ N.; 9° 50′ E.); town, Jutland, Denmark. Pop. 1921; 27,588.

HORSE-POWER. See under ENGINE.

HORSE RACING. See RACING.

HORSE-RADISH, COCHLEARIA ARMORACIA, natural order *Cruciferoe.* The root, long, cylindrical, and fleshy, with an enlarged upper end, is used as a condiment.

HORSE-SHOEING, the custom of protecting horses' hoofs is probably coeval with domestication of horse; machine-made shoes have been largely used since Goodenough's patent invention, 1860.

HORSETAIL, vascular cryptogam with green stem and branches and brown, scale-like leaves. One generation reproduces by spores, the next by male and female cells.

HORTA (27° 30′ N., 30° W.) town on Fayal, Portug. Azores; fisheries, Pop. *c.* 7,000.

HORTEN (59° 24′ N., 10° 28′ E.), port, Norway. Pop. 1920, 10,413.

HORTENSE (1783-1837). See BEAUHARNAIS.

HORTENSIUS, QUINTUS, dictator to end of plebeian secession at Rome, 286 B.C.; passed *lex Hortensia,* giving independent legislative power to *plebs.*

HORTENSIUS, QUINTUS (141-50 B.C.), Rom. orator; became consul in 69 B.C.; attained fame as advocate.

HORTICULTURE. See GARDEN.

HORUS, Egyptian sun-god, represented by the hawk; divided Egyptian reverence with Osiris.

HORWICH (53° 36′ N., 2° 33′ W.), town, Lancashire, England. Pop. 16,500.

HOSAIN (*d.* 680), younger *s.* of the Caliph Ali by Fatima; tragedy of his death is re-enacted annually by the Shiites.

HOSANNA, salutation of the crowd when Christ made His triumphal entry into Jerusalem (*Mark* $11_{9,10}$), being part of an ancient Heb. ceremonial.

HOSE, skintight foot and leg coverings, formerly reaching to the waist; the XVI.-cent. breeches were called *trunk-hose.*

HOSEA, Old Testament minor prophet. H. was a contemporary of Isaiah, and prophesied during reigns of last six kings of Israel, from Jeroboam II. to Hoshea. The book may be divided into two parts: the first (chaps. 1-3) relates the unfaithfulness of the prophet's wife, which is used as a symbol of idolatry of nation; and the second (chaps. 4-14) is a series of accusations against Children of Israel for their wickedness, which is unsparingly denounced. H. makes use of illustrations taken from domestic and rural occupations, such as baking reaping, and sowing. Book is frequently quoted in New Testament, quotations occurring in the Gospels of *Matthew* and *Luke* the *Apocalypse,* and the Epistle to the *Romans.*

HOSE-PIPE, india-rubber implement for conveyance of water. The fire h.-p is covered with carefully woven linen cloth, made circular, without seam, and done by handloom for important purposes.

HOSHANGABAD (22° 43′ N., 77° 39′ E.), town (and district), Central Provinces, India. Pop. *c.* 15,000; district has pop. *c.* 449,000.

HOSHEA (slain 721), last king of Israel; refused to pay tribute to Shalmeneser IV., king of Assyria, who attacked Israel.

HOSHIARPUR (31° 33′ N., 75° 48′ E.), town, Punjab, India; manufactures lacquer, cottons. Pop. *c.* 18,000. H. district has area of 2244 sq. miles. Pop. *c.* 990,000.

HOSIERY, stockings (see HOSE) and garments similarly manufactured by knitting. Unlike weaving, knitting is supposed to have been a late mediaeval, probably Scot., invention. Shawls, when made by hand, are knitted with two long bone needles, stockings and other round seamless things with four steel needles; one needle suffices for crochet. The stocking-frame was invented in 1589 by Lee, and completed by the addition of Jedediah Strutt's invention for rib-stitch in 1758. The warp loom was first introduced in 1775. Matthew Townsend introduced the latch needle in 1858. Circular and flat frames by which seamless h. is obtained have been invented by Fr., Ger., Belg., Eng., and Amer. manufacturers.

HOSIUS (*d.* 359), dp. of Cordova; authoritative member of Council of Nicaea, 325.

HOSIUS, STANISLAUS (1504-79), Polish cardinal, who suppressed Reformation in Poland.

HOSKINS, JOHN (*d.* 1664), Eng. miniature painter, whose works are much sought after by collectors.

HOSMER, HARRIET G. (1830-1908), an American sculptor, *b.* in Watertown, Mass. Without much training she first confined herself to modelling in clay,

then studied anatomy at a medical college in St. Louis, Mo. In 1852 she went to Rome, where she came under the influence of John Gibson, an English sculptor. Shortly after she exhibited 'Puck' in the United States, which immediately won her a high class reputation. Her 'Will-o'-the-Wisp' added to her name in the following year. Among her public works is a statue of Benton, the Missouri statesman, standing in Lafayette Park, in St. Louis.

HOSMER, JAMES KENDALL (1834), an American university president and writer, *b.* in Northfield, Mass. He graduated from Harvard University, in 1855, studied theology and was ordained a Unitarian pastor, in 1860. During the Civil War he served in the Union Army as a private. After the war he taught English and history at Antioch College, the University of Missouri, and Washington University, and during 1892-1904 was librarian of the Minneapolis Public Library. Among his books are *The Color Guard*, 1864; *A Short History of German Literature*, 1878; *A Short History of Anglo-Saxon Freedom*, 1890; *How Thankful Was Bewitched*, 1894; and *A History of the Louisiana Purchase*, 1902.

HOSPICE, house of shelter for pilgrims and travellers, usually founded and maintained by some religious order.

HOSPITAL CORPS, UNITED STATES. The Medical Services of both the Army and Navy have such corps, for which recruits are enlisted and trained to qualify for tending the incapacitated and the wounded. The duties of the hospital corps are non-military, and the personnel are only subject to drills necessary for their physical efficiency. The army hospital corps consists of sergeants, corporals, cooks and privates, whose functions are to perform all needful hospital service in camp, garrison or field. The naval hospital corps undertakes like duties in naval hospitals, naval stations, navy yards and marine barracks and in subsidiary branches of the naval service, such as the coast survey. The personnel embraces pharmacists, stewards and apprentices. Enlistments for the army hospital corps are made through army medical officers, and those for the navy corps (except apprentices, who can be enlisted like other recruits) through the Surgeon-General.

HOSPITALLERS (*Ordo fratrum hospitalariorum Hierosolymitanorum* and *Ordo militiae Santci Johannis Baptistae hospitalis Hierosolymitani*), religious military order. Its pre-Christian foundation is merely traditional. The constant stream of pilgrims to Holy Land, from the beginning of Christian era, increased after the erection of Church of Holy Sepulchre by Constantine. Pope Gregory the Great, at close of VI. cent., founded a hospital at Jerusalem. Persians captured Jerusalem, 614, but Charlemagne established a protectorate over Holy Places, 797-99, and refounded Pope Gregory's hospital, which was served by Benedictine monks from Mount of Olives. Turks captured Jerusalem, 1070-87, and destroyed all Christian edifices. Christian merchants of Amalfi obtained permission from Turks and established a hospital, *c.* 1050, again probably served by Benedictines; still under invocation of St. Mary.

Gerard, *d.* 1120, was the true founder and first Grand Master of the later hospital, of which he became Institutor by papal bull, 1113. The Crusaders and every Western country bestowed lands on the hospital, and in 1113 the pope confirmed these grants. Gerard was succeeded by Raymond du Puy, *d.* 1158-60. Mention of a Constable in 1126 seems to point to military character already. From 1137 the Knights Hospitallers took prominent part in crusades. Augustinian rule was given to the Order before 1153, as it was confirmed by Pope Eugenius III.; threefold vow of poverty, chastity, obedience; duty to be servants of the poor (*fraires pauperibus servientes*). Successive regulations were codified by Grand Master Pierre d'Aubusson, 1489. On suppression of Templars, 1313, their lands were granted to Hospitallers.

They were forced to fly from Jerusalem, 1187; held out against Saracens at Acre till 1291; held Rhodes, 1310-1522, and became known as *Knights of Rhodes*; Turks at last took Rhodes, 1522, and knights retired of Malta, granted them by Charles V., 1530. Grand Master Philippe de Villiers de l'Isle d'Adam strenuously continued war against Turks from the Order's new home, and his successor, La Vallette, defended Malta in famous siege, 1565. In XVIII. cent. Order became merely rich aristocratic picturseque institution. Possessions in England were lost at Reformation; possessions in France confiscated, 1792. Napoleon captured Malta, 1798. Malta is still seat of the Order.

HOSPITAL SHIPS belong to one of three classes, (1) naval or military; (2) Merchant marine; (3) Civil. Military hospital ships usually exist only during a state of war, and are used for transporting wounded soldiers from the country where military operations are in progress to hospitals overseas. For instance, during the European war, hospital ships were used to transport wounded Ameri-

can and British soldiers from the French and other fronts to England and America. Naval hospital ships may be permanently attached to a navy, to care for sick, injured or wounded sailors, or for ship-wrecked persons. In the U. S. Navy, a hospital ship is commanded by a naval medical officer not below the rank of surgeon. Under him, are merchant officers and crew for navigation, and doctors, nurses and orderlies to care for the sick and injured. The merchant officers have full control over the navigation of the ship and the maintenance of discipline among the crew. According to an agreement of the second Geneva Convention, of 1868, merchantmen or hospital ships having wounded on board, or boats rescuing wounded or shipwrecked, are immune from attack or capture. A hospital ship must carry no arms or ammunition, except such as are necessary for protection of the wounded or for maintenance of order on board. U. S. Navy hospital ships are painted white with a broad green horizontal stripe. If the ship belongs to an organization, such as the Red Cross, the stripe is red instead of green. They fly the Red Cross flag as well as the national ensign. An example of a merchant marine hospital ship is the U. S. coastguard cutter Androscoggin, which was converted into a hospital for caring for the men of the north Atlantic fishing fleet. Two well-known civil hospital ships are the Bellevue Hospital ship for tuberculous children from New York City, and the Boston Floating Hospital.

HOSPITALS. The monastic orders that arose with the spread of Christianity were among the first to care for the sick by systematized institutions, though hospitals of a sort had been founded long before in pagan times. The elaborate hospital system of modern days had its origin in those remote monastic retreats. The Crusades produced the Hospitallers, who were knights devoted to serving the sick, and also the orders of Sisters of Mercy, Sisters of Charity and kindred bodies. The more notable hospitals of the distant past were at Alexandria, Ephesus, Constantinople and Caesarea, where St. Basil founded a great establishment with special provision for lepers. Among the earliest hospitals also was the Hotel Dieu in Paris, the first hospital in France and the oldest in existence today, dating from the sixth century. Three centuries later the Archbishop of Canterbury founded one in England. famous London hospital of St. Bartholomew's had its beginnings in 1123, and that of St. Thomas in 1215. Other renowned English institutions did not appear till the eighteenth century—Westminister in 1719, Guy's in 1725 and the Royal Infirmary of Edinburgh in 1730. The growth of universities developed the study of medicine, and many hospitals became identified as departments with schools of learning. The great hospitals in Italy, France, England and Scotland thus became noted medical schools.

American hospitals were naturally founded upon European methods, especially English, and began with the Pennsylvania Hospital, Philadelphia, established in 1730, of which Benjamin Franklin was clerk. The next American hospital of note was the New York Hospital, chartered in 1771. These led the way to the erection of hospitals in every American community, urban and rural, built and conducted on lines so far in advance of the European models that Old World hospitals now look frequently to American methods and practice to guide them in improving their efficiency.

Hospitals are either charitable institutions wholly, or semi-charitable, receiving both free and pay patients ,or receive pay patients only. They may be supported wholly or in part by federal, state or municipal funds, or maintained by religious or other organizations, or by private endowment. Among those under municipal control and reserved solely for the city poor are the Johns Hopkins Hospital, Baltimore, the Philadelphia Hospital, Bellevue and allied institutions in New York City, Massachusetts. General and Boston City Hospitals in Boston, and Cook County Hospital in Chicago. There are also many notable institutions founded by private gifts and sectarian societies throughout the country. In large part the country's hospitals that general cases, but there are many both charitable and private, devoted to the treatment of special disorders, such as ailments of the eye, ear, nose and throat, cancer and tuberculosis, and contagious skin diseases, while there are also hospitals for children and women, the incurable and the insane. Other hospitals are those maintained by the army at Hot Springs, Arkansas (where there is also a naval hospital), and at Denver Colo.; Presidio, San Francisco; Manila, Philippines; Honolulu, Hawaii; Takoma Park, State of Washington; and at El Paso, Texas. Kindred institutions are the dispensaries and clinics, where patients who do not require hospital attention are treated, and sanatoria, public and private, for invalids and convalescents.

HOSPODAR (Russian *Gospodar*); a Slavonic term meaning 'lord,' 'master', is the titie which is specially applied to the head of a family or the master of a

house. It was a title of the rulers of Wallachia and Moldavia from the 15th century to 1866, when Rumania became independent. The title was also used by the grand-dukes of Lithuania and the kings of Poland down to John Sobieski.

HOST (Lat. *hostia*, sacrifice); the element of bread in the Eucharist; circular unleavened wafers marked with emblems of the Crucifixion are used in the R. C. Church; these emblems were forbidden at the Reformation.

HOSTAGE, a person given up to an enemy as a security for the performance of certain articles of a treaty or other conditions. On the surrender of a town, victors and vanquished gave such personal security for fulfilment of terms, the h's being later exchanged.

HOT AIR ENGINES are heat motors in which the working substance (usually air) does not experience a change in physical state throughout the cycle. There are two general classes of Hot Air Engines:

(A) Those in which the air used does not come into contact with the flame of the heat source, but is heated by conduction from this source and also by a regenerator which serves to conserve some of the heat left in the air after expansion. This would otherwise be rejected to the refrigerator and lost. The air, in these engines, is not discharged at the end of the cycle, but used again; consequently the cycle is a closed one.

(B) Those which use as a working substance the products of combustion of the heat source mixed with some air. In these engines the cycle is not a closed one, and the working substance is exhausted at the end of the stroke.

The engine consists of a means for heating air, or other similar gas, and a cylinder in which the heated gas is allowed to expand, thereby acting on a piston and doing useful work.

The theoretical heat efficiency of such an engine is high, much higher than when the working substance suffers a change in physical state during the cycle (such as the steam engine and boiler) because no heat is lost through a change of state.

The practical efficiency of the engine as compared with the theoretical is, however, low for numerous reasons too complicated to discuss here. For this reason and because its weight per horse power is large, this engine is used in practice only where a very simple and safe machine is required, *e.g.* for fog signals in light houses—pumping small quantities of water in dwellings, etc.

The expansion of air by heat was first utilized by Hero of Alexandria—Egypt in 130 B.C. in his device for mysteriously (?) opening doors. Practical development of the Hot Air Engine was begun in 1807 by Sir Geo. Cayley. Many other engineers worked on the idea, notable among them being Ericsson and Stirling.

HOTCHKISS, BENJAMIN BERKLEY (1826-1885), an American inventor, *b.* in Watertown, Conn. He made many inventions in fire-arms, the most notable of which are the Hotchkiss magazine rifle and the Hotchkiss machine gun.

HOTCHKISS (MACHINE) GUN. A machine gun working on much the same principles as the Colt (Browning) gun. The mechanism of the gun is actuated by a helical spring. This is compressed by a piston operated by the expanding gases produced by the burning (explosion) of the charge of powder. The cylinder in which the piston operates connects with the gun barrel at a point near the muzzle. The volume of this cylinder, and consequently the force actuating the piston is adjustable, thereby permitting the regulation of the speed at which the whole mechanism works. This arm is unique, in that there is no separate spring to actuate the firing pin, the main spring performing the service in such a way that the breech must be tightly closed before it can act on the firing pin striker, thus preventing the prefiring of a cartridge. Another important feature is the arrangement whereby the breech cannot be opened until the projectile has left the barrel and the burnt gases have had time to escape from the muzzle. The ammunition is fed by metal strips or clips holding 30 cartridges each. The gun is usually sighted to 2,000 yards and can fire 500-600 rounds per minute. It weighs 53 lbs. without a mount.

HÔTEL-DE-VILLE, Fr. term corresponding to Eng. town hall; it usually contains barracks, prison, court-house, offices of local bodies, and residence of chief magistrate. Famous H. of Paris, burnt during riots of Commune, 1871, has been rebuilt.

HÔTEL-DIEU (God-house) Fr. name for important hospitals; some, like those of Angers and Beaune, are of architectural interest.

HOTHO, HEINRICH GUSTAV (1802-73), Ger. writer; author of an important work on Flemish and Ger. painters.

HOTMAN, FRANÇOIS (1524-90); Fr. author; embraced Reformed religion; undertook Huguenot missions to Ger. princes; prof. of Law in various univ's; Councillor to Henry of Navarre, 1580; wrote *Franco-Gallia*, etc.

HOT SPRINGS, a city of Arkansas, in Garland co., of which it is the county seat. It is on the St. Louis, Iron Mountain and Southern, the Memphis, Dallas and Gulf, and the Chicago, Rock Island and Pacific railroads, and on Hot Springs Creek. It derives its name from the presence in and about the town of thermal springs which contain valuable medicinal qualities. These springs are over seventy in number and they flow from the side of a hill. The water often reaches a temperature of 150°. It is a much frequented resort for invalids and others. In the city is a U. S. Army and Navy Hospital, a convent, and a national bank. There is a large farming trade with the surrounding community and in the neighborhood of the city are mines of lead and silver. Pop. 1920, 11,695.

HOTTENTOTS, South African aborigines (calling themselves *Khoikhoi*, Men of Men); sometimes but erroneously supposed to include Bushmen (*q.v.*) Their quaint language, with its 'click' sounds, led the early Dutch settlers to dub them H's (*i.e.* 'jabberers'). They were decimated and driven southwards by Bantu (or Kafirs) and pure H's now number only from 50,000 to 100,000; mostly in Cape of Good Hope, but several thousand survive in Ger. S.W. Africa. They are of middle statute, have yellowish-brown skins, woolly hair, and are characterised by steatopygia. Their tribes were pastoral and peaceful under patriarchal rule; they used poisoned arrows. Their folklore is described in Bleek's *Reynard in South Africa*.

HÖTZENDORFF, CONRAD VON, Austrian general; in first years of World War chief of Austrian general staff; constant friction with Falkenhayn, Hötzendorff believing road to success was *via* Asiago, Falkenhayn *via* Verdun. Relations improved when Hindenburg succeeded Falkenhayn. Formula of German Kaiser as to united action accepted by Austria-Hungary, Turkey, and Bulgaria, but Hötzendorff insisted on second clause guaranteeing same consideration for integrity and protection of Dual Monarchy as for German Empire.

HOUDETOT, COMTESSE DE, ÉLISABETH FRANÇOISE SOPHIE DE LA LIVE DE BELLEGARDE (1730-1813), wife of the Fr. general Claude Constance César, Count de H., of old territorial family; she rejected Rousseau's advances, preferring St. Lambert.

HOUDON, JEAN ANTOINE (1740-1828), Fr. sculptor; won *Prix de Rome*, 1761; studied in Italy for ten years; achieved great success with statue of St. Bruno; later works included statues of Washington, Cicero, and Voltaire; and busts of Napoleon, Molière, Rousseau, Nev. and D'Alembert.

HOUGH, EMERSON (1857-1923), an American author, *b.* in Newton, Ia. He graduated from the University of Iowa, in 1880. In 1895 he made an exploring trip in the midst of winter through Yellowstone Park, the result of which was an Act of Congress, protecting the Park buffalo. Among his books are *The Singing Mouse Stories*, 1895; *The Story of the Cowboy*, 1897; *The Mississippi Bubble*, 1902; *The Young Alaskans*, 1910; *The Lady and the Pirate*, 1913; *The Young Alaskans in the Far North*, 1918; *The Sagebrusher*, 1919 and *The Covered Wagon*, 1922; *North of 36*, 1923.

HOUGHTON, ALANSON BIGELOW (1863), manufacturer; *b.* in Cambridge, Mass.; 1886 Bachelor of Arts, Harvard College. Post graduate at Berlin and Paris, 1899 entered manufacturing of glass at Corning, 1903-1910 second vice president, 1910-1918 president, chairman of board since, Corning Glass Works. Director of Metropolitan Life Insurance Company. Ex-president of Board of Education, Corning. Elected to Congress for term of 1919-1923, resigned to become Minister Plenipotentiary and Ambassador Extraordinary to Germany in 1922. Trustee of St. Stephen's College and Hobart College.

HOUGHTON, GEORGE CLARKE (1852-1923), an American Protestant Episcopal clergyman, *b.* in New York City. He graduated from St. Stephens College in 1867 and afterwards studied at the General Theological Seminary. He was appointed curate of Trinity parish in 1870, continuing there until 1879, when he was appointed rector of Trinity Church in Hoboken. In 1887 he became rector of the Church of the Transfiguration, better known as 'The Little Church Around the Corner', which was founded by his uncle, George H. Houghton, in 1848. This church is famous throughout the country for its liberality in matters of belief and practice. It gained its name through the willingness of Dr. Houghton to perform burial services for actors, after they had been refused by the pastor of another church, who suggested 'The Little Church Around the Corner'. Dr. Houghton remained rector of this church until his death. He wrote much on theological subjects and was one of the best known clergymen in the country.

HOUGHTON, RICHARD MONCKTON MILNES, 1ST BARON (1809-85), Eng. poet and critic; received a peerage, 1863; pub. *Poetry for the People*, 1840;

Palm Leaves, 1848; and other vol's. of verse; also a life of Keats; a generous patron of poets and authors.

HOUGHTON-LE-SPRING (54° 51′ N., 1° 29′ W.), town, Durham, England. Pop. 10,000.

HOULTON, a city of Maine, in Aroostook co., of which it is the county seat. It is on the Bangor and Aroostook and the Canadian Pacific railroad. It is the center of an important farming region and its industries include foundry and machine shops, lumber mills, woolen mills, a starch factory, etc. It is the seat of the Rickert Classical Institute. It has a high school, public library, hospitals and a park. Pop. 1920, 6,191.

HOUND. See Dog Family.

HOUND'S-TONGUE (CYNOGLOSSUM), genus of plants of order Boraginaceae (*q.v.*). Common hound's-tongue (*C. officinale*), has small red flowers and downy leaves.

HOUNSLOW (51° 28′ N., 0° 22′ W.), town, Middlesex, England; formerly site of priory. H. Heath was a highwayman's haunt. Pop. 12,000.

HOURI, name given in the Koran to the seventy-two beautiful women who are assigned to every 'Faithful' as spouses on entering the Muhammadan paradise.

HOURS, CANONICAL, special times in the day for devotion in Catholic Church, viz. Matins, Lauds, Prime, Terce, Sect, None, Vespers (Evensong), and Compline.

HOUSE, EDWARD MANDELL (1856), American peace envoy; *b.* Houston, Texas, of English parentage. He graduated from Cornell in 1881 and thereafter devoted his attention to Democratic politics, state and national, without seeking office. In 1914 he became prominent as a confidential envoy and adviser of President Wilson, who sent him to Europe in that year on a diplomatic mission before the outbreak of the World War. In the war period he visited Europe again as the President's representative to consult with the belligerent governments. On the United States entering the conflict in 1917 he attended in London the meetings of the Supreme War Council of the Allies as chairman of the American mission, and in that capacity communicated America's views regarding the conduct of the war to the allied premiers and foreign ministers. When peace appeared in 1918 he was designated by the President to act for the United States in the negotiations for the armistice with the Central Powers. Next to President Wilson he was the most prominent American who figured on the war councils of Europe and throughout the war period was the subject of considerable attention in the American and foreign press. He edited with Charles Seymour, *What Happened at Paris*, 1921, a compilation recording the story of the Peace Conference of 1918-19, as told by the American delegates.

HOUSE BREAKING. See Theft.

HOUSE-FLY (MUSCIDÆ). With the house-fly (*Musca domestica*) are ranked the blue-bottles (*Calliphora*), green-bottles (Lucilia), and the dreaded African tsetse-fly (*Glossina*). The eggs of Muscid flies are generally laid upon dung, decaying matter, or carrion, and upon this the larvae feed. In this way they are of some value as scavengers; but otherwise they cause much trouble. The house-fly may carry germs of disease upon its feet or proboscis, and transfer these to human food; the larvae of blue-bottles and green-bottles frequently bore into the skin of sheep, causing great irritation and sometimes death; the 'screw-worm' larva of one species of *Lucilia* bores in the nasal cavities of man and higher animals; and tsetse-flies are the carriers of the organisms which cause the fatal native disease of sleeping sickness and the troublesome animal disease, nagana, in Africa.

HOUSE OF COMMONS. See Parliament.

HOUSE OF LORDS. See Parliament.

HOUSE OF REPRESENTATIVES. See Congress.

HOUSING. The assuring of proper housing conditions for populations in large cities has only in comparatively recent times become a matter of marked concern to municipal, state and national governments. It has come to be realized that not only altruism but self interest prescribe the establishment of such conditions, since the health and happiness of the people are matters of vital interest to state and nation.

The movement for better living conditions in the United States began in New York City in 1842, when attention was called to the housing situation in a special report on the sanitation of the city. Since that time, almost all the large cities of the country have adopted plans for the betterment of dwellings. Chief among these are; protection against fire and means of escape in case of fire; light and ventilation; sanitary protection, the latter including water

supply, toilet accommodations and the prevention of overcrowding.

In many cities tenements must be fireproof, and fire escapes are required in buildings over three stories in height. Light and ventilation are secured by provisions for minimum open spaces and limitation of the proportion of a lot that can be occupied by a building. In New York, water must be furnished on every floor and one toilet accommodation must exist for every two families.

Model tenements, combining artistic attractiveness with abundance of light, air and sanitary conveniences, have been built by private enterprise in over 124 cities of the United States, while nearly 700 cities have taken an active interest in the improvement of housing conditions.

In Great Britain, the movement for better housing has been largely under the direction of municipal and state governments, which have not only regulated construction but actually built thousands of model dwellings, thus differing from the United States where the actual building has been done by private concerns. The limitation on the height of houses is stricter in Great Britain than in this country. In London, Glasgow, Manchester, Liverpool and Edinburgh, vast slum areas have had their dilapidated buildings razed and model municipal tenements built in their places. The regulations in Berlin and Paris are more elaborate, though in general they aim at the same end and follow the same fundamental ideas as in the United States.

HOUSMAN, ALFRED EDWARD (1859), Eng. poet and scholar; prof. of Latin, Cambridge; author of *A Shropshire Lad*, 1896.

HOUSMAN, LAURENCE (1867), Eng. writer and artist; first achieved celebrity as book-illustrator; author of *An Englishwoman's Love Letters*, 1900; *A Modern Antaeus, Sabrina Warham*, etc.; also plays and several vol's of verse.

HOUSSAYE, ARSÉNE (1815-96), Fr. novelist and poet; his novels include *Les Filles d' Eve, La Couronne de Bluets*, etc.; poetry, *Cent et un sonnets*, also dramas, critical and hist. works. His s. Henri, 1848, is a historian and academician.

HOUSTON, a city of Texas, in Harris co., of which it is the county seat. It is on the Gulf, Colorado and Sante Fe, the Texas and New Orleans, the International and Great Northern, the Missouri, Kansas and Texas, and other railroads, and on Buffalo Bayou, 50 miles northwest of Galveston with which it is connected by a ship canal accommodating large steamships. It is the second city of the State in population and industrial importance. It is well built on both sides of the Bayou, which is spanned by several bridges. Among the public buildings are a city hall and market house, the Houston Lyceum, the cotton exchange, a Masonic Temple, Union Station, and a post office. The city is the seat of several educational institutions including the William M. Rice Polytechnic Institute. There is an excellent street system, two public high schools and a public library. Houston is the most important city of the State in manufactures. Its industries include plants for the making of oil, furniture, iron castings, cigars, brick, pottery, jewelry, paints, chemicals, soap, etc. There are also railroad and machine shops, sugar and pump mills and cotton compresses. There are several banks and other financial institutions. The city is lighted by gas and electricity, has an abundant water supply, electric street railways and all the other essentials of a modern city. The exchanges at the United States Clearing House amount to nearly one billion dollars annually. Houston was settled in 1836 and in 1837 was the capital of the Republic of Texas. Pop. 1920, 138,276.

HOUSTON, DAVID FRANKLIN. (1866), an American public official, *b.* in Monroe, N. C. He graduated from South Carolina College, in 1887, taught school for some years and during 1900-2 was professor of political science at the University of Texas. During 1902-5 he was president of that institution, and during 1908-16 he was chancellor of Washington University, in St. Louis, Mo. In 1913 he was appointed by President Wilson Secretary of the Department of Agriculture, which position he held until 1920, after which he was Secretary of the Treasury until the end of the administration. He is the author of *A Critical Study of Nullification in South Carolina.*

HOUSTON HEIGHTS, a post town of Harris co., Texas, U.S.A., 4m. N.W. of Houston. Now incorporated with city of Houston.

HOUSTON, SAM (1793-1863), an American statesman, soldier, adventurer and one of the most picturesque figures in American history. He was *b.* near Lexington, Va., but at the age of thirteen went to Tennessee with his parents. Several years later he struck into the western wilderness and for some years lived among the Indians, being adopted by one of the chiefs. In 1813 he returned to civilization, enlisted as a private in

the army and chanced to come under the observation of General Jackson, whose influence caused him to be appointed Indian agent among the Cherokees. A year later he resigned, because of a clash with higher authorities, who objected to his zeal in preventing the importation of slaves through Florida, then a Spanish province. In 1823 he was elected to Congress from Tennessee, was re-elected in 1825, and in 1827 he was elected Governor of the State. He resigned two years later and abruptly left civilization to return to his Indian friends. In 1832 he appeared in Texas and during the war between the United States and Mexico was elected commander-in-chief of the Texan Army, brilliantly distinguishing himself as such. In 1836 he was elected President of the Republic of Texas, and again in 1841, and when, in 1845, Texas entered the Union as a state, he represented it in the U. S. Senate, until 1859, when he was elected Governor. In 1861 he was deposed on account of his strong anti-slavery sentiment, whereupon he retired into private life.

HOUWALD, CHRISTOPH ERNST, FREIHERR VON (1778-1845), Ger. dramatist and author; pub. *Romantische Akkorder, Jakob Thau, der Hofnarr,* etc.; also some plays.

HOVA, OR MERINA, the dominant tribes of Madagascar, occupying the plateau of Imerina; small and slightly built, yellow complexion, hair black and long; converts to Christianity.

HOVE (50° 50′ N., 0° 21′ W.), town, Sussex, England. Pop. 1921, 46,519.

HOVEY, RICHARD (1864-1900), an American poet, *b.* in Normall, Ill. He graduated from Dartmouth, in 1885, after which he was, first an actor, then a journalist, and finally a lecturer on English literature at Barnard College ,in New York City. His best poems are published in two collections; *Along the Trail,* 1898 and *To the End of the Trail,* 1908. He also wrote *Songs from Vagabondia,* 1893, in collaboration with Bliss Carman.

HOWARD, old Eng. family, said to have been settled in Norfolk as far back as X. cent. In XV. cent. Sir Robert H. married the *d.* of Mowbray, Duke of Norfolk, and his *s.*, Sir John H., was in 1483 cr. Duke of Norfolk and Earl Marshal of England, an office hereditary in the family ever since. The first duke was killed at *Bosworth* and attainted; but his *s.* Thomas won battle of *Flodden,* and regained the dukedom in 1514; third duke was uncle of Anne Boleyn and Catherine Howard, queens of Henry VIII.; his *gs.* and successor m. heiress of Arundel earldom, thus bringing that title to the H. family; this duke was afterwards attainted and beheaded for plotting in favor of Mary, Queen of Scots, 1572. The family regained dukedom from Charles II. after the Restoration. Present is 15th duke, and is premier duke of England. The Earls of Effingham, Suffolk, ahd Carlisle are of same stock.

HOWARD, BRONSON (1842-1908), Amer. playwright; among his plays are *Young Mrs. Winthrop* and *Old Love Letters.*

HOWARD, CATHERINE (1521-42), fifth queen of Henry VIII.; *d.* of Lord Edmund Howard; m. Henry, 1540; charged with unfaithfulness, and beheaded in Tower.

HOWARD, JOHN (1726-1790), famous Eng. philanthropist; *b.* in London. On being app. high sheriff of Bedford, he inspected the prison, and finding many abuses both there and in other Eng. gaols which he subsequently visited, gave himself up to securing reforms in management of prisons and prisoners. He afterwards visited the prisons of many European countries, which he described, with those of England, in his *State of Prisons* (pub. 1777). He also carried out researches on the plague.

HOWARD, KATHLEEN, an Anglo-American opera singer, *b.* in Canada. She studied singing under Oscar Saenger in New York and under Jean de Reszke, in Paris. For a time she was a choir singer in New York, then, in 1907, made her debut in Metz, Germany, with such success that she continued singing there for two years. For three seasons she was the leading contralto of the Court Opera at Darmstadt. In 1913 she appeared at Covent Garden, in London, later in the season coming to New York, where she was the leading contralto of the Century Opera Co. Since 1916 she has been a member of the Metropolitan Opera Co.

HOWARD, LELAND OSSIAN (1857), an American entomologist, *b.* in Rockford, Ill. He graduated from Cornell University, in 1877, then became assistant entomologist in the Bureau of Entomology in the U. S. Department of Agriculture, of which he has been chief since 1894. Since 1904 he has been consulting entomologist of the U. S. Public Health Service. He is the author of *Mosquitos—How They Live,* 1901; *The House Fly—Disease Carrier,*

1911; and of many government bulletins and pamphlets.

HOWARD OF EFFINGHAM, WILLIAM, 1ST BARON (*c.* 1510-73), Eng. admiral; gov. of Calais, 1552; Lord High Admiral, 1553; raised to peerage, 1554; highly esteemed for his public services under Henry VIII. and Elizabeth.

HOWARD OF EFFINGHAM, CHARLES, 2ND BARON (1536-1624), Eng. admiral; Lord High Admiral, 1585-1619; commanded Eng. fleet against Armada, 1588; joint-commander in expedition against Cadiz, 1596; cr. Earl of Northampton, 1596; ambassador to Spain, 1605. His first wife, Katharine Carey, according to legend, failed to deliver Essex's ring to Queen Elizabeth.

HOWARD, OLIVER OTIS (1830-1909), an American soldier, *b.* in Leeds, Me. He graduated from the West Point military academy, in 1854, was professor of mathematics there during 1857-61 after which he went to the front as a colonel of Volunteers, having command of the Third Maine Regiment. He participated in the battles of Antietam and Fredericksburg and led the 11th and 12th corps at Chancellorville and Gettysburg. Later he had command of the Army of the Tennessee, and during Sherman's 'march to the sea' he had command of the right wing of Sherman's force. After the war he was for a while president of Howard University, an educational institution for negroes in Washington, D. C., which was named in his honor. In 1886 he was promoted to the rank of major-general in the regular army. He wrote *Donald's School Days*, 1879 and *Fighting for Humanity*, 1898.

HOWARD, SIR ROBERT (1626-98), Eng. dramatist; *s.* of Earl of Berkshire; fought on king's side in Civil War; wrote *The Committee*, 1663, a comedy, and collaborated with his bro.-in-law, Dryden, in *The Indian Queen*.

HOWARD COLLEGE, an educational institution founded in Birmingham, Ala., in 1841, under the auspices of the Baptist Church. In 1922 it had a teaching staff of 22 and a student body of 294. Its library contains 20,000 volumes.

HOWARD UNIVERSITY, a co-educational institution for negroes in Washington, D. C., founded in 1867 under the auspices of the Federal Government, through the Freedman's Bureau, at the time Gen. O. O. Howard was director of that institution and therefore named from him. While it also has a department of manual training, it prepares its students largely for professional careers, having departments of law, medicine, dentistry, theology (undenominational) and music. A large portion of the negroes in the professions have graduated from it. The Federal Government contributes about $100,000 yearly towards its upkeep. In 1922 its faculty numbered 157 and its students 1,954.

HOWE, EDGAR WARD (1854), an American journalist and writer, *b.* near Huntington, Iowa. For many years he edited the Atchison Daily Globe, which his wise and philosophic writings made one of the most quoted newspapers in the country. He retired from the editorship in 1918 and thereafter contribnted to periodicals and issued occasionally a journal of his own. He also wrote several books, the best known of which is *The Story of a Country Town*.

HOWE, ELIAS, JR., (1819-1867), an American inventor, *b.* in Spenser, Mass. His father was a farmer and local miller and the son remained at home as his assistant, until 1836, when he began to learn the trade of machinist. In 1845 he completed a working model of a sewing machine, which he patented. For the following nine years he was engaged in a continuous law suit to protect his patent from the infringements of manufacturers, but finally won and thereafter enjoyed a steady income from the royalties paid him by the manufacturers of sewing machines. During the Civil War he fought in the Union Army as a private, after which he established a manufacturing plant in Bridgeport, Conn.

HOWE, HENRY MARION (1848-1922), an American metallurgist, *b.* in Boston, Mass. He graduated from Harvard University, in 1869. Since 1897 he has been professor of metallurgy at Columbia University. He is the author of *Copper Smelting*, 1885; *Metallurgy of Steel* 1891; *Iron, Steel and other Alloys*, 1903; and *The Metallography of Steel and Cast Iron*, 1916.

HOWE, JULIA WARD (1819-1910), an American writer, *b.* in New York City. She married Dr. Samuel Gridley Howe, and together they established and edited the Boston Daily Commonwealth, which they made largely an abolitionist organ. In 1861 she wrote *The Battle Hymn of the Republic*, which made her famous. After the war she became interested in the women's suffrage movement and wrote and lectured for it. She wrote *Sex and Education*, 1874; *Modern Society*, 1881; *Reminiscences*, 1819-1899, and *Sketches of Representative Women of New England*, 1905.

HOWE, MARK ANTHONY DE WOLFE (1864), an American editor and

writer, *b.* in Bristol, R. I. He graduated from Harvard University, in 1887, was for some years associate editor of The Youth's Companion and assistant editor of the Atlantic Monthly during 1893-5. During 1913-19 he was editor of the Harvard Alumni Bulletin. Among his books are *Shadows*, 1897; *Boston, the Place of the People*, 1903; *Harmonies*, a book of Verse, 1909; *The Atlantic Monthly and its Makers*, 1919; and *George von Lengerke Meyer—His Life and Public Services*, 1919.

HOWE, RICHARD, EARL HOWE (1726-99), Brit. admiral; saw considerable service during war of Amer. Revolution; as commander of Channel fleet, relieved Gibraltar in 1782; First Lord of Admiralty 1683; on June 1, 1794, defeated French off Cape Ushant, day of this victory being long known as *Glorious First of June.*

HOWE, SAMUEL GRIDLEY (1801-1876), an American physician, *b.* in Boston, Mass. He graduated from Brown University, in 1821 and studied medicine. Moved emotionally by the writings of Byron, he went to Greece, in 1824, and participated in the Greek Revolution, eventually becoming chief surgeon of the Greek Navy. Later he also joined the revolutionists in Poland and spent some weeks in a Prussian prison. His fame, however, rested on the great work which he later accomplished in the education of the blind, after his return to the United States, in 1830. He became superintendent of the Perkins Institute for the Blind, in Massachusetts, and did much to develop the raised letter method of reading.

HOWE, WILLIAM, 5TH VISCOUNT HOWE (1729-1814), Brit. general; distinguished himself at *Abraham's Heights*, Quebec; commander-in-chief in Amer. War of Independence.

HOWEL DDA ('the God') (*d.* 950), king of Wales, 943; maintained peace and codified the laws.

HOWELL, CLARK (1863), an American editor, *b.* in Barnwall co., S. C., He graduated from the University of Georgia, in 1883 and in the following year joined the staff of the Atlanta Constitution. In 1889 he became editor, and in 1897 succeeded his father as editor-in-chief. Since then he has also been a director of the Associated Press. In 1886 he was elected to the Georgia House of Representatives, being Speaker during 1890-1. During 1900-6 he was a member of the State Senate.

HOWELL, JAMES (*d.* 1666), Brit. author; travelled extensively and famed for his Royalist sympathies; wrote *Dodona's Grove*, an allegory, and numerous other works but chiefly noted for his *Familiar Letters*, 1645-55, written in the Fleet prison.

HOWELLS, WILLIAM DEAN (1837-1920) Novelist, essayist, and poet. *B.* in Martins Ferry, Ohio, March 1, 1837; *d.* in New York, April 11, 1920. The *s.* of a country printer and newspaper editor he had no regular education, but was brought up among books and in a literary atmosphere. From 1840 to 1849 he lived at Hamilton, Ohio, which he has described in *A Boys' Town*. After some experience writing for newspapers he was appointed U. S. consul to Venice, Italy, 1861-1865. On his return to the United States he formed connections with the N. Y. Tribune, Times and The Nation, and edited the Atlantic Monthly, 1871-1881. He wrote *The Editors Study* for Harper's Monthly, 1886-1891 and was editor of The Cosmopolitan for a short time, returning to Harpers to write *The Easy Chair* for the Monthly until his death. He was a founder and the president of the American Academy of Arts and Letters. In the first rank of American novelists he was also noted as poet and essayist. Few authors in his class have been more prolific. Among his principal works are *Poems*, 1873-1886, and 1895. Novels: *Their Wedding Journey*, 1871; *A Chance Acquaintance*, 1872; *A Foregone Conclusion*, 1875; *Lady of the Aroostook*, 1878; *A Modern Instance*, 1882; *A Womans Reason*, 1883; *The Rise of Silas Lapham*, 1885; *April Hopes*, 1888; *Annie Kilburn*, 1889; *The Kentons*, 1902; *New Leaf Mills*, 1913; *The Leatherwood God*, 1919. Travels: *Venetian Life*, 1866; *Italian Journeys*, *Tuscan Cities*, *Some English Towns*, *Spanish Travels* also *Years of My Youth* and *Years of My Middle Life*, 1920 and one act plays *The Mouse Trap*, *The Elevator*, etc.

HOWITT, MARY (1799-1888), an author, wife of William H., wrote much in collaboration with her husband. She wrote numerous children's books, which were very popular in their day; and she rendered a distinct service to literature by translating the novels of Frederika Bremer and many of the tales of Hans Andersen. In 1886 she published her *Reminiscences of my Later Life* (in *Good Words*). Her work was healthy, but, apart from the translations, ephemeral. There is a biography by her daughter, Margaret H., 1889.

HOWITT, WILLIAM (1791-1879), an author, began to write at an early age, and when he was thirteen, one of his poems appeared in the *Monthly Magazine.*

In 1821 he married Mary Botham, and husband and wife wrote many books in collaboration. He had no special call to authorship, and became a very miscellaneous writer. *The Book of the Season*, 1831; a *Popular History of Priestcraft*, 1833; *Pantilla, or Traditions of the Most Ancient Times*, 1835; and the *Rural Life of England*, 1838, give some idea of his scope. In 1852 he visited Tasmania and Australia, and on his return wrote several books on these places, but none of them have any particular value. His most successful work was a *Popular History of England*, 1856-62.

HOWITZER, light ordnance used in field and siege operations; of 5-in. and 6-in. calibre, throwing shells of from 50 to 120 lb.

HOWRAH (22° 31′ N., 88° 20′ E.), town, Bengal, India; jute, cotton. Pop. *c.* 160,000. District has area 509 sq. miles. Pop. *c.* 860,000.

HOWTH (53° 23′ N., 6° 3′ W.), town, County Dublin, Ireland. Pop. 1,200.

HOY (58° 50′ N., 3° 18′ W.), mountainous island, Orkney, Scotland; has celebrated Dwarfie Stone, in which are excavated rooms. Pop. 1,216.

HOYLAKE (53° 24′ N., 3° 11′ W.), town, Cheshire, England. Pop. (with W. Kirby, 1911), 15,0;0.

HOYLAND NETHER (53° 30′ N., 1° 26′ W.), town, Yorkshire, England. Pop. 15,000.

HOYLE, EDMOND (1672-1769), Eng. pioneer authority on whist; wrote on games, and taught whist in London; his *Short Treatise on Whist* was pub. 1742.

HRDLICKA, ALES (1869), a Bohemian-American anthropologist *b.* in Humpolec Bohemia. He studied in his native country and in New York, later carrying on investigations among the insane and other defective classes in the New York State service. Since 1898 he has been almost continuously in the field for the U. S. National Musuem as anthropologist, participating in expeditions to Mexico, the Balkans, South America, Asia and various parts of the United States.

HSUAN-TSANG (fl. 664), Chin. writer of travels; became a Buddhist monk in early life, won great reputation for learning and sanctity, and finally visited India in order to penetrate Buddhist arcana; he traversed vast deserts alone, and left invaluable accounts of the districts through which he passed. The Ind. pilgrimage was considered specially meritorious by the Chin. Buddhists, whose writings are an important source for history of India.

HUANCAVELICA (12° 55′ E., 75° 2′ W.), town, Peru, S. America. Pop. *c.* 6,000; of dept. *c.* 167,840.

HUARTE DE SAN JUAN (1530-92), Span. physician renouned for his writings showing the connection between psychology and physiology.

HUBBARD, ELBERT (1859-1915), an American writer, *b.* in Bloomington, Ill. Leaving his father's farm at the age of 14, he worked in a printing shop and later in a soap factory, eventually becoming part owner of the latter. Selling out his interest, he established a handicrafts colony in East Aurora, N. Y., from which he issued *The Philistine*, a monthly publication which had many admirers. He wrote a great deal of 'success' literature, which found a wide reading among those who made material success their sole ideal. Among his writings are *Little Journeys* (biographical sketches); *The Message to Garcia*, 1898, and *Hollyhocks and Goldenglow*, 1912.

HUBERT, ST. (656-728), bp. of Liége; feast-day, Nov. 3; patron saint of hunters. Legend says that he was converted by appearance of Christ on the Cross above the deer's head when shooting.

HUBLI (15° 18′ N., 75° 11′ E.), town, Bombay, India. Pop. 65,000.

HUC, EVARISTE RÉGIS (1813-60), Fr. missionary; after an unsuccessful mission to Tibet, wrote *Voyage dans la Tartarie, le Thibet et la Chine*, 1851-52, and other valuable books on those regions.

HU-CHOW-FU (30° 49′ N., 120° 5′ E.), town, Cheh-kiang, China.

HUCKABACK, thick linen material much used for face towels.

HUCKLEBERRY, also called **WHORTLEBERRY, BILBERRY, BLUEBERRY WHINBERRY** (*Vaccinium myrtillus*), a small shrub with drooping wax-like, flesh-coloured flowers, followed by dark blue berries of an agreeable flavor. The red W., or cowberry (*V. vitis,idoea*), occurs on mountainous heaths and bears red berries. The marsh W., or cranberry (*Oxycoccus palustris*), is a prostrate plant with dark red berries and occurs on peat bogs.

HUCKNALL TORKARD (53° 2′ N., 1° 12′ W.), town, Nottinghamshire, England. Pop. 16,000.

HUDDERSFIELD (53° 39′ N., 1° 47′ W.), town, Yorkshire, England; situated in extensive coal-field; centre of 'fancy' woolen industry; manufactures iron goods, machinery; fine public buildings and park. Pop. 110,000.

HUDSON, a town of Middlesex co., Mass., U. S. A., on Assabet R. 15 m. N.E. of Worcester. It has manufs. of leather, rubber shoes webbing, gossamers, paper boxes lasts, etc. Pop. 1920 7,607.

HUDSON, a city of New York, in Columbia co., of which it is the county seat. It is on the New York Central and the Boston and Albany railroads, and on the Hudson River. It is the trade center of an extensive farming and manufacturing region and is connected by steamship lines with all the Hudson River points. Its industries are of great importance and include the making of iron wire, woolen goods, bricks, machines, etc. It is the seat of the State Home of Refuge for Women. Pop. 1920, 11,745.

HUDSON BAY (*c.* 60 N., 87° W.), great inland sea, N. E. of North America; receives drainage of great part of Canada by Churchill, Nelson, Albany, and other rivers. Area, *c.* 500,000 sq. miles; connected with Atlantic by Hudson Strait. A railway is being built to connect H. B. with the centre and west of Canada. Hudson Strait is open to navigation for two or three months in the year. See map CANADA.

HUDSON FALLS, a village of New York, in Washington co. Pop. 1920, 5,761.

HUDSON, HENRY (*d.* 1611), famous Brit. explorer. In 1607 he attempted to discover a N.E. passage to Pacific; in 1609 explored H. River; afterwards sailed to Arctic Ocean, hoping to find a N.W. passage; discovered H. Strait and Bay. On last voyage crew mutinied, and H. and others were cast adrift and never heard of again.

HUDSON RIVER, beautiful and important river in New York state, U. S. (41° 50′ N., 73° 58′ W.), called after Henry Hudson, who first explored it, 1609; rises in Adirondack Mts.; total length, *c.* 350 m. (tidal, *c.* 150). Principal tributaries are Sacondaga, Mohawk, and Wallkill. About 60 m. from New York (at mouth) the river passes through picturesque highlands into great expanse —Haverstraw and Tappan (*c.* 12 m. by 4½) Bays—after which a steep wall (called the Palisades), rising 300-500 ft. from brink of river (here 1 or 2 m. broad and called *North River*), extends to upper part of New York.

HUDSON'S BAY COMPANY, joint-stock company, founded 1670 by Prince Rupert and seventeen others, under charter from Charles II., for the importation of furs and skins into Gt. Britain from N. America. In 1869 its exclusive rights were ceded to the Brit. Government for $1,500,000, but the trade is still continued under certain reservations.

HUÉ (16° 24′ N., 107° 32′ E.), fortified town, Fr. Indo-China; capital of Annam; has royal palace. Pop. *c.* 50,000.

HUE AND CRY, old process, in Eng. law, of pursuing felons with horn-blowing and shouting; if taken, they were summarily dealt with; later meaning, police proclamation regarding offenders, etc.

HUEHUETENANGO (15° 30′ N., 91° 41′ W.), town, Guatemala, Cent. America. Pop. 1905, *c.* 12,000. H. department has area of 5,700 sq. miles. Pop. *c.* 120,000.

HUELVA (37° 32′ N., 6° 50′ W.), frontier province, S.W. Spain; area, 3,913 sq. miles; has valuable copper mines. Pop. 1910, 309,744. Its capital, Huelva, has pop. 28,000.

HUERCAL OVERA (37° 26′ N., 2° 1′ W.), town, S.E. Spain. Pop. 16,000.

HUERTA, ADOLFO DE LA (1877), Mexican president; educated business man of studious habits; during revolution, 1913, acted as General Obregon's representative at Carranza's head-quarters. Appointed governor of Sonora, 1919; and succeeded Carranza as president after revolution on 1920. See MEXICO.

HUERTA, VICTORIANO (1854-1916), Mexican president and soldier; of Indian parentage; befriended by Juarez, and educated in Military Coll., Mexico City, where he had a successful career; became general, 1901; repressed the Chihuahua rebellion, 1912 and was trusted by Porfirio Diaz; was appointed military commandant of Federal District, 1913; after resignation of Porfirio Diaz, May, 1911, entered service of President Madero; combined with General Felix Diaz to make Madero a prisoner and force him to resign, upon which he became interim president. He incurred odium in U.S. for his share in murder of Madero, and this led to protracted conflict with America, Feb. 1913. After his confirmation in the office of president, Carranza and Villa headed rebellion against him. Repudiated the National Debt, thereby precipitating anarchy, only remedied by Amer. intervention. Resigned in summer of 1914,

and took up residence in U. S.; arrested, July, 1915 for violating Amer. neutrality, but died before being brought to trial.

HUESCA (42° 11′ N., 0° 10′ W.), province, Spain; area, 5,848 sq. miles; watered by Aragon and other affluents of Ebro, N. occupied by Pyrenees; produces wine, grain, fruit. Pop. 250,000. Its capital, Huesca, has a cathedral. Pop. 13,000.

HUGGINS, SIR WILLIAM (1824-1910), Eng. astronomer; pioneer in stellar spectroscopy and photography; made many striking discoveries relative to origin, constitution, and condition of the heavenly bodies; list of papers in his *Atlas of Representative Stellar Spectra.*

HUGH THE GREAT (*d.* 956), Duke of the Franks and Count of Paris; founder of the fortunes of his house, and *f.* of H. Capet.

HUGH CAPET (*c.* 938-96), king of France; founder of Capetian dynasty; *s.* of Hugh, Count of Paris and Duke of France; elected and crowned, 987; warred against Charles of Lorraine, his capture of whom in 991 closed the war.

HUGH DE PUISET (*c.* 1125-95), bp. of Durham and Earl of Northumberland; exercised powerful influence upon the political affairs of the reign of Richard I.

HUGH OF ST. CHER (*c.* 1200-63), Fr. Dominican priest and cardinal; besides playing prominent part as a churchman, wrote theological works of interest.

HUGH OF ST. VICTOR (*c.* 1079-1141), canon of Hamersleben, Saxony; had great reputation as mystic in XII. cent.

HUGH, ST., OF LINCOLN, OR OF AVALON (*c.* 1140-1200), prior of first Eng. Carthusian house at Witham (Somerset); bp. of Lincoln, 1186; strong defender of rights of Church, and pious man; not to be confused with Hugh of Wells, bp. of Lincoln, or St. Hugh of Lincoln, Christian boy traditionally crucified by Jews.

HUGHES, CHARLES EVANS (1862), American jurist and executive; *b.* Glens Falls, N. Y. He studied at Madison (now Colgate) University, 1876-78; and graduated at Brown University, 1881. Graduating from Columbia Law School in 1884, he entered at once on the practice of law in New York City. He first came into national notice when in 1905 he acted as special counsel for legislative committees investigating gas and insurance management, his remarkable work resulting in the adoption of immensely valuable reforms. In 1906 he was elected Republican governor of New York State and was re-elected two years later. His career in that office was one of notable achievement. In 1910 he was appointed by President Taft an associate justice of the U. S. Supreme Court, and served on that bench for six years. He was nominated for President on the Republican ticket in 1916, but was defeated by Woodrow Wilson and returned to the practice of law. By presidential appointment he investigated the alleged irregularities in the building of army and navy planes during the war. In March, 1921, he became Secretary of State in President Harding's cabinet. He presided at the Conference on the Limitation of Armaments held in Washington, 1921-22, and created a sensation at the first session by his proposal for the 'scrapping' of capital ships and the establishment of the 'naval holiday.' Other important problems handled by him during his administration of State affairs have been those relating to the German treaty, the question of mandates, the oil controversy and American participation in the World Court, 1923.

HUGHES, JOHN (1797-1864), R.C. divine; went to America from Ireland, 1817; bp. of New York; keen Catholic controversialist.

HUGHES, RUPERT (1872), an American author, *b.* in Lancaster, Mo. He graduated from the Western Reserve University, in 1892. For some years he was assistant editor of Godey's Magazine, Current Literature and The Criterion, in London, then, in 1902, came to New York, where he was for three years on the staff of the Encyclopedia Britannica. Before and during the war with Germany he served in the Volunteer Corps, retiring with the rank of major. He is one of the most voluminous of American authors, and has acquired wide popularity. Among his books are *The Whirlwind*, 1902; *Love Affairs of Great Musicians*, 1903; *Empty Pockets*, 1915; *The Unpardonable Sin*, 1919; *The Cup of Fury*, 1919; *What's the World Coming to?* 1920; *Monna*, 1912; and *Souls for Sale*, 1922. He has also written a number of plays, among these being *The Cat Bird*, (produced 1920), and *Tess of the Storm Country.*

HUGHES, SIR SAMUEL (1853-1921) Canadian soldier and public official educated at Toronto Univ., and the Royal Military School; lecturer in English language, literature, and history in the Toronto Collegiate Institute, 1875-85;

joined the militia and took part in the Fenian raid, 1870; promoted lieutenant-colonel, 1897; served in South African War; member of the Dominion Parliament since 1892; minister of militia and defence, 1911-16. On outbreak of the World War he had charge of the organizing of Canadian troops, whom he later accompanied to France; appointed major-general, 1914, and knighted, 1915.

HUGHES, THOMAS (XVI. cent.), Eng. dramatist; wrote *The Misfortunes of Arthur*, played before Queen Elizabeth at Greenwich, 1588.

HUGHES, THOMAS (1822-96), Eng. judge and author; ed. Rugby and Oxford; became a County Court judge; was greatly influenced by the religious views of F. D. Maurice and Kingsley; pub. *The Manliness of Christ*, 1879. He is best known, however, by his famous story, *Tom Brown's Schooldays*, 1857; and its sequel, *Tom Brown at Oxford*, 1861.

HUGHES, RT. HON. WILLIAM MORRIS (1864), Australian statesman; *b.* in Wales; went to Australia, 1884, and entered politics as member of the Legislative Assembly of New South Wales, 1893; a position he resigned on becoming member of the Federal Parliament; devoted himself to the interest of Labor,and advocated a very advanced policy; was attorney-general in various labor administrations, 1908-15; prime minister, 1915; defeated twice on the subject of conscription, he broke with the extreme section of his party, and formed a coalition with the Liberals; again defeated in 1922; represented the Commonwealth at the Imperial War Cabinet, 1918; Australian delegate to the Peace Conference.

HUGLI, HOOGHLY (22° 57′ N., 88° 19′ E.), town, Bengal, India, on H. River; has fine mosque and various educational establishments. Pop. 29,383. H. district has area of *c.* 1,200 sq. miles. Pop. 220,000.

HUGLI, HOOGHLY (21° 40′ N., 87° 50′ E.), most westerly mouth of Ganges, entering Indian Ocean, and that up which trade passes to Calcutta.

HUGO, GUSTAV VON (1764-1844), Ger. jurist; chiefly known for his *Lehrbuch eines Zivilistischen Kursus* 1792-1821.

HUGO, VICTOR MARIE (1802-85), Fr. author; *b.* at Besancon; travelled with his *f.*, General Count Hugo, 1774-1828, through Spain and Italy during Napoleonic campaigns; returned to Paris for education. From outset H.'s private and public life were troubled. Nearly all his children died in his lifetime, and he lived his last years with his grandchildren. H. entered Parliament after Revolution of 1848; became ardent Republican, and after *coup d'etat* of Dec. 2, 1851, retired to Channel Islands until 1870; returned to Paris, and took deep interest in politics, working with all his might for abolition of capital punishment, etc. His funeral was a magnificent one, and he was laid to rest in the Pantheon as perhaps the greatest figure in Fr. Lit.

H. was the great leader of Romantic School of Fr. lit. (see under France), His poems, dramas, and romances, on every subject and in numberless forms, aroused an enthusiasm almost unparalleled in lit.; through him the current set definitely in favor of the new Romantic movement; his dramas, *Hernani*, 1830; *Le Roi s'amuse*, 1832; *Lucrece Borgia*, 1933, etc., and novels, *Le Dernier Jour d'un condamne*, 1829, *Notre-Dame de Paris*, 1831; *Les Miserables*, 1862; *Les Travailleurs de la Mer*, 1866; *L' Homme qui Rit*, 1869; were epoch-making and were only surpassed in greatness by his lyrics. H.'s rhetorical effects are somewhat alien to the austerer age which has followed; but he will always remain one of the literary giants of the XIX. cent.

HUGUENOTS, name given to Fr. Protestants who in XVI. and XVII. cent's banded themselves together to secure personal liberty and religious freedom. Long struggle began in 1562, with massacre of number of H's at Vassy by R.C. followers of the Guises, and towards close of same year the H's were defeated at *Dreux*; two months later the murder of Duke of Guise by a Calvinist fanatic put an end to hostilities, and peace of Amboise was arranged, 1563. In 1567 war again broke out, and H's were defeated at *St. Denis*; by Treaty of Longjumeau, 1568 peace was restored for a short time; but the following year saw a resumption of hostilities; the H's again suffering defeat at *Jarnac*, while Condé was murdered, 1569. Henry of Navarre and Coligny then became leaders of Prot. party, and in 1570 hostilities again came to an end by Treaty of St. Germains.

Two years later occurred the terrible massacre of St. Bartholomew's Eve, Aug. 24, 1572; the example of Paris was followed in other towns,and in two months from 20,000 to 30,000 H's were slain in France. The remainder again took up arms and were successful in obtaining in 1575 numerous concessions, some of which were subsequently revoked. In 1589 Henry of Navarre came to Fr. throne, and in 1598 he granted religious freedom by Edict of Nantes; but after

his death civil war recommenced and H's were again defeated. For many years, in spite of confirmation of Edict of Nantes, they were subjected to persecution; and in 1685 the Edict was revoked, great numbers of H's fled from the country, and their church was annihilated; revived in XVIII. cent., and after various vicissitudes finally obtained equality with rest of population after the Revolution.

HUITZILOPOCHTLI, ancient Mexican war-god, to whom wholesale human sacrifice was made.

HULDA, Teutonic goddess of the spindle and marriage.

HULL (45° 23′ N., 75° 46′ W.), town, Quebec, Canada; paper- and sawmills. Pop. 1921, 32,766.

HULL, KINGSTON-ON-HULL (53° 45′ N., 0° 20′ W.), river-port and borough, Yorkshire, England, with Holy Trinity Church, St. Mary's Lowgate, 1333, town hall, library, theatre, nautical school, and extensive docks. Shipbuilding, machinery, chains, ropes, canvas, chemicals, tanning, sugar-refining, etc. H. made free borough of Kingston-on-Hull by Edward I., 1299; besieged by Royalists, 1643; extensive trade with Continent, and headquarters for deep-sea fisheries. Pop. 1921, 287,01.3

HULL (from A. S. *helan,* to cover), capsule or chrysalis; whole lower part of a ship.

HULL, ISAAC (1773-1843), an American naval officer, *b.* in Derby, Conn. He went to sea as a cabin boy at the age of 14 and became a skipper before he was 21. In 1798 he joined the Navy, and at the opening of the War of 1812 he was commander of the frigate "Constitution'. On August 19, 1812, he encountered the British ship 'Guerrière', a vessel slightly inferior to his own, and captured it. Being the first victory of the war for the United States, popular joy was unbounded and Hull was the popular hero of the time. Later he was promoted to the rank of commodore and commanded a squadron in the Mediterranean.

HULL, WILLIAM (1735-1825), an American soldier, *b.* at Derby, Conn.; he studied law and was called to the bar in 1775. He fought with distinction in the War of Independence, and received the personal thanks of Washington for his services. He was made governor of Michigan Territory by Jefferson in 1805 and held the office till 1812, when he was appointed commander of the north-western army during the war with Great Britain. He was sent with 1500 men to defend Detroit. a task which presented great difficulties and in which he failed. He was court-martialled for cowardice and sentenced to be shot, but the sentence of death was not carried out.

HULSE, JOHN (1708:90), Eng. divine who bequeathed funds to Cambridge Univ. for four lectures (Hulsean Lectures) to be delivered before the univ. annually on the evidencesof the Christian religion.

HUMACAO (18° 16′ N., 65° 44′ W.); town, Porto Rico, W. Indies. Pop. 5,000.

HUMANE SOCIETY, AMERICAN, Organized in Cleveland, Ohio, in 1877, consolidating a number of other socieities engaged in humane work. The chief aim of the society is to prevent cruelty to children and animals. One of its first activities was to secure State laws to regulate cattle trains, and protect cattle from suffering in transit. They offered $5,000 for a model cattle car, and in 1900 prizes for monographs of vivisection open to colleges and medical students. The society now includes over 300 affiliated societies. Membership 10,000. The official organ is The National Humane Review. Headquarters, Albany, New York. President, 1922. Dr. W. O. Stillman.

HUMANISM, literally that which attaches primary importance to man, but used more specifically of Renaissance movement of XV. cent., and beginning of modern thought.

HUMANITARIAN.—(1) humane; (2) denying divinity of Christ, while accepting God the Father; (3) erecting morality into a religion.

HUMAYUN, NASR ED-DIN, MUHAMMAD (*c.* 1510-56), emperor of Delhi; second of the Mogul line, and preserved realm acquired by his *f.*, Baber (*q.v.*), though first spent many years in fighting.

HUMBER (53° 40′ N., 0° 12′ W.). estuary of Trent and Yorkshire Ouse, E. coast of England, between York and Lincoln.

HUMBERT I., RANIERI CARLO GIOVANNI MARIA FERDINANDO EUGENIO (1844-1900), king of Italy, *s.* of Victor Emmanuel II.; succ. 1788; supported Triple Alliance and also maintained friendly relations with Britain; advocated colonisation on Red Sea littoral; assassinated by anarchist Bresci.

HUMBOLDT, FRIEDRICH HEINRICH ALEXANDER, BARON VON (1769-1859), Ger. naturalist and explorer; explored course of the Orinoco, the Andes, the Amazon, and Mexico. He introduced *quano* into Europe and in 1817 delineated *isothermal* lines. Besides accounts of the natural history of the regions he explored he wrote works on plant distribution, laws of temperature, magnetism, volcanoes, terrestrial magnetism, and the igneous nature of rocks. He devoted much attention to climate and the conditions which control it. As a favorite of Frederick William III, of Prussia, he could not undertake further expeditions. with the exception of a journey to Siberia, in his sixtieth year, during which he determined the height of the plateau and discovered diamonds in the gold washings of the Ural. In his seventy-sixth year he wrote the *Kosmos*, in which are embodied the results of his personal observations and his generalisations from those and his wide scientific knowledge.

HUMBOLDT, KARL WILHELM VON (1767-1835), Ger. statesman and author of valuable philological works; *b.* of above; as Prussian member of Public Instruction established Univ. of Berlin, 1809.

HUME, DAVID (1711-1776), Scot. historian and philosopher; *b.* Edinburgh; *s.* of a small landowner in Berwickshire; studied at Edinburgh Univ., and became interested in speculation; in 1739 pub. first two vol's of *Treatise of Human Nature*, but to his bitter disappointment the work was a failure; tried, unsuccessfully, to get chair of Moral Philosophy at Edinburgh, 1744; made librarian at Advocate's Library, Edinburgh, 1751. His *Philosophical Essays* were pub. in 1748, and *Political Discourses*, 1751. In 1753 H. set to work to write the history of England. His qualifications and aims in writing were distinctly above those of his day, though by no means equal to those of ours. His *Natural History of Religion* appeared in 1757. He was much honored during the visit he paid to Paris in 1763; app. Under-Sec. of State to the Home Department, 1766; in London, 1767-69; returned to Edinburgh; had a furious quarrel with Rousseau; latterly in much better financial circumstances than before; *d.* a much respected man.

H's, hist. work was important, but his *History of England* has long been superseded and does not survive to the extent *e.g.*, of Gibbon's *Decline and Fall*. In economics he was an opponent of the Mercantilists. He perceived the connection between economics and sociology, and the importance of hist. treatment. He believed firmly in free trade.

HUMERUS. See SKELETON.

HUMIDITY. See ATMOSPHERE, WEATHER.

HUMILIATI, Ital. religious order; origin uncertain, perhaps at Rome, 1178; rule granted by Innocent III., 1201, to order of priests (the third, a lay order originally, then also one of women); suppressed, 1571.

HUMMEL, JOHANN NEPOMUK (1778-1837), composer and pianist; *b.* Pressburg, Hungary; brilliant extempore player; best compositions pianoforte and chamber music.

HUMMING-BIRD, name given to members of the *Torchilidoe* on account of humming sound produced by their extremely rapid wing-pulsations. The *Torchilidoe*, which include the smallest known birds, are confined to the New World, the majority occurring in equatorial and subtropical belts, although the family's range extends from Alaska to Tierra del Fuego. The males' exquisitely lustrous and gorgeous plumage defies description, and its distribution in tufts, gorgets, crests, and the like, enhances its native brilliance. H-b's seldom rest, but flit tirelessly from blossom to blossom, feeding on honey-loving insects, by means of long, tubular, forked tongues, and doubtless assisting in fertilisation of the flowers visited. The nest is a highly finished structure, closely resembling its surroundings, being clothed with mosses and lichens. The males are exceedingly pugnacious, fighting fiercely among themselves, and also attacking, with remarkable valor, any creature passing near the sitting hen.

HUMOR (Lat. *humor*, damp) had already become an Eng. word of the same equivalence as its Lat. progenitor in 1382, but had then already been applied to what the Schoolmen named the cardinal fluids of the body—blood, choler, melancholy, and phlegm. The predominant h. became the means of classification of temperaments; thus the word is used by Shakespeare and the XVII.-cent. writers of 'comedies of h's.' In late XVII. cent. h. appears as a term for a sense of broad fun. To-day, wit is an intellectual cleverness which raises a smile; it may be unkind, unsympathetic. H. is more elemental, it is of the heart, not the intellect; it is born of incongruous incidents, and its product is laughter. Oscar Wilde was a wit; J. M. Barrie is a humorist.

In drama wit is the province of comedy; h., of farce. Notable humorists are Aristophanes, Chaucer, Dunbar, Rabelais, Molière, Cervantes, Shakespeare (great wit also), Swift, Sterne, Addison,

Fielding, Smollett, Goldsmith, Dickens, O. Wendell Holmes, Mark Twain, Max Adeler, Charles Lever, Jerome K. Jerome, W. W. Jacobs, Stephen Leacock.

HUMPHREYS, ALEXANDER CROMBIE (1851), a Scotch-American educator, *b.* in Edinburgh, Scotland. He came to this country as a boy and during 1872-81 worked for a commercial firm, at the same time studying at the Stevens Institute of Technology, in Jersey City, N. J. For many years he was the head of a gas producing firm. Since 1902 he was been president of the Stevens Institute of Technology. He is the author of *Lecture Notes on Some of the Business Features of Engineering Practice*, 1905.

HU-NAN (27° 30′ N.; 111° 30′ E.), province, Central China; area, *c.* 83,380 sq. miles; surface hilly; lies in Yangtse-Kiang basin; coal, tea, rice. Pop. 20,000,000.

HUNDRED (A.-S. *hund*, hundred; red signifies computation), Eng. numeral. The h. as a division of the shire may have been originally the land inhabited by 100 families; tradition ascribed the institution of the h. to Alfred the Great, but it is probably much older; divisions corresponding to the h. are called *wards* in N., *wapentakes* in Yorks and Midlands, *rape* in Sussex, *lathe* in Kent.

HUNDRED DAYS. See FRANCE. (History, 1815).

HUNDRED YEARS WAR, struggle between England and France, 1337-1453, originating in English claim to crown of France; from 1337 to 1364 fortune favored English; then ensued a period of French success; after 1380 French again suffered disaster, but they rallied under Joan of Arc in 1429, and the English were expelled in 1453. See ENGLAND AND FRANCE (HISTORY).

HUNEKER, JAMES GIBBONS (1860-1921), an American musical critic, *b.* in Philadelphia, Pa. He acquired a musical education under Georges Mathias, in Paris, and on returning to this country became a teacher of the piano at the National Conservatory. Ten years later he joined the staff of the New York Sun as musical and dramatic critic, his writings gaining him a wide recognition. Among his books are *The Melomaniacs*, 1902; *Iconoclasts*, 1905; *Egoists*, 1909; *The Pathos of Distance*, 1913, and *The Steeplejack*, 1921.

HUNGARY, OR MAGYARIA, inland republic of Central Europe (45° 50′-48° 30′ N., 16°-23° 10′ E.), bounded B. by Czecho-Slovakia by Jugo-Slavia, W. by Austria. Surface is mainly plains of middle Danube and its trib. the Tisza (Theiss); the smaller, called the 'Little Hungarian Alföld,' or Pressburg Basin, covers an area of *c.* 6,000 sq. m., and lies W. of Bakony or Mávra, which separ tes it from the Great Hungarian Alföld, the largest plain in Europe, extending over *c.* 37,000 sq. m., and with an average height of 300 to 350 ft.; the Lower Hungarian Highlands extend between the Danube and Lake Balaton, and attain an altitude of *c.* 2,200 ft. in Mesek Hills. The Danube enters republic below Pozsony (Pressburg), turns S. in traversing Bakony Forest, and crosses into Jugo-Slavia, near Baja; it forms several large islands—*e. g.*, Czallok Szent-Endre, Csepel; navigable for vessels drawing 6 ft.; Tisza rises in Carpathians, enters Hungary *c.* 22° E., and crosses S. border below Szegedin; navigable for steamers to Tokaj, but not generally ascended beyong Tisza Füred; country subject to river floods; many marshes. Largest lakes are Balaton (265 sq. m.) and Fertö; small lakes numerous. The Aggtelek or Baradla Cave in Gömör co., and Fonacza Cave in Bihar, with fossil remains, are among many interesting caverns.

Climate is continental; maximum rainfall of early summer is followed by remarkably dry period. The greater part of the Alföld consists of wide open, treeless steppes called pusztas, where graze vast herds of horses, cattle, buffaloes, sheep, and swine; but many acres have recently been converted to the plough, the soil being excellently adapted for the growing of wheat. Agriculture is important, and wheat, rye, barley, oats, and maize of excellent quality are grown; the land is divided among peasant proprietors, who engage largely in bee-keeping and silk culture; the forests yield oak, beach, and pine, fruits, especially apples, apricots, table grapes, peaches, plums, and pears, are largely produced; tobacco, sugar beet, and hops are grown; chief minerals are gold, silver, lead, copper, quicksilver, iron, coal, antimony, and sulphur; salt is a state monopoly. Industries include brewing and distilling, sugar and flour milling, and tobacco. Railway mileage, *c.* 13,000; navigable waterways, *c.* 2,000 m.

Population and Area.—The non-Aryan Magyars came from the Ural Mts. *c.* 890; they form almost the entire pop., estimated, 1919 at 12,000,000. Area, *c.* 60,000 sq. m.

Education and Religion.—In 1910 over 60 per cent. of Magyars could read and write. A national system of education on non-sectarian lines is under consideration; there are universities at Budapest

(cap.), Pozsony, and Debreczen. All religions are tolerated.

Constitution since 1918.—After the *debacle* of Nov., 1918 (see WORLD WAR,), a republic was proclaimed under Karolyi, but ignoring President Wilson's 'self-determination' principle, Rumania, Czecho-Slovakia, and Jugo-Slavia seized parts of Hungarian territory. On Karolyi's resignation, March, 1919, the Hungarians, influenced by Bela Kun (or Cohen), who had been Lenin's secretary, set up a Soviet government. Bolshevism was fanned by Jewish refugees and repatriated prisoners from Russia. Rumanian forces occupied Budapest, and a Socialist government (Aug. 1-7) gave way to the Archduke Joseph as provisional president. On a protest by the delegates of the League of Nations he resigned, Admiral Horthy being elected provisional chief of state in March, 1920. —See map CZECHO-SLOVAKIA, AUSTRIA-HUNGARY.

History.—See AUSTRIA-HUNGARY.

Literature of Hungary was for a long time confined to Latin, under the influence of the Catholic clergy; at the close of the 18th cent., however, the natural language was revived, and Hungarian literature is now in a healthy state; the Magyars have no lack of dramatic art and excel in belles-lettres; owing to their strong political character, legal and constitutional questions have long been a popular subject with writers, statesmen, and scholars; there are many writers on jurisprudence, one work, *The Theory of Law and Civil Society*, by Prof. Pulszky, being written in English.

The Magyars have been no less successful in literature of an historical nature, especially in monographs; these histories, written in early times in Latin, have of late made very good progress, bnt the tendency is to lean towards monographs, with a resulting dearth of more general histories; there is the same want in literary histories; the monographs, however, are of an excellent standard. A favorite subject of study is that of aesthetics, and 20th cent. writers have also made excellent progress in the departments of science proper.

HUNGER, an indefinite sensation usually referred to the stomach, but also combined with a non-localised feeling of weakness or faintness. Normal H. is not of necessity strictly periodic, but training may result in its recurrence becoming regular.

HUNGERFORD, MARGARET WOLFE (*c.* 1855-97), an Irish novelist, *b.* in Ireland. Mrs. H. made a name for herself by her breezy Irish love-stories, of which the best known are: *Molly Bawn*, 1878; *Mrs. Geoffrey*, 1881; *April's Lady*, 1891; and *A Conquering Heroine*, 1892.

HUNS, Mongolian race who invaded Europe in IV. cent. A.D. They waged war with the Goths then inhabiting Central Europe, and drove them S. into Spain, Italy, and Balkan Peninsula, thus indirectly causing destruction of Rom. Empire. Under Attila (*q.v.*), they founded a large empire, which after his death was disintegrated. All trace of them in Europe has now been lost, although at one time they reached as far W. as Gaul. Probably akin to the White H's who invaded Persia in V. cent.

HUNT, GAILLARD (1862), an American writer, *b.* in New Orleans, La. He graduated from the Emerson Institute, in Washington, D. C., then entered the government service. From 1900 to'909, he was chief of the Bureau of Citizenship, in the Department of State, then chief of the Division of Manuscripts in the Congressional Library, till 1917. Since 1921 he has been editor for the Department of State. Among his writings are *The Seal of the United States*, 1892; *The Department of State, Its History and Functions*, 1914; and *Life in America One Hundred Years Ago*, 1914.

HUNT, HENRY JACKSON (1819-89), an American soldier, *b.* at Detroit, Mich. He served throughout the Mexican War under Scott, and distinguished himself at Contreras, Churubusco, and Chapultepec. He fought at Bull Run, 1861, and became chief of artillery in the Washington defences, and later held a similar post in the army of the Potomac. At the close of the war he assisted in the reorganisation of the United States army, and was made president of the permanent Artillery Board. In 1883, after holding various commands, he retired, and became the governor of the Soldier's Home, Washington, D.C.

HUNT, JAMES HENRY LEIGH (1784-1859), Eng. poet and essayist; *b.* Southgate; ed. Christ's Hospital; became clerk in War Office; subsequently editor of *The Examiner*, 1808; a Radical newspaper, founded by his bro.; was fined and imprisoned, 1813, for two years for publishing an uncomplimentary truth about the Prince Regent; publ. his best-known poem, *The Story of Rimini*, 1816. Amongst other journalistic ventures may be mentioned the starting of *The Indicator*, 1818; *The Companion*, 1828; *The Tatler*, 1830 and *Leigh Hunt's London Journal*, 1834. Amongst his original works may be named *Lord Byron and his Contemporaries*, 1828; *Collected Poems* 1832; *A Legend of Florence* (drama), *Sir Ralph Esher* (novel), *Imagination and Fancy, Wit and Humour, The Town,*

Men, Women, and *Books,* etc. His *Autobiography* was pub. 1850. H. was intimately associated with Keats, Byron, and other poets of the day.

HUNT, RICHARD MORRIS (1828-1895), an American architect, *b.* at Brattleboro, Vt. He graduated from the Ecole des Beaux Arts, in Paris, then traveled extensively with one of his former teachers. In 1855 he returned to this country. His reputation was established on a series of important works of which he was architect; the Capitol extension, in Washington, D. C., the Lenox Library building, in New York, the Yorktown Monument, in Virginia, the Presbyterian Hospital, in New York, the pedestal of the Statue of Liberty, in New York Harbor and a number of similar public buildings. He was a founder and president of the American Institute of Architects. His influence on American architecture has been very extensive.

HUNT, WILLIAM HOLMAN (1827-1910). Eng. artist; *b.* London; turned from commerce to art; formed friendship with Millais, and became one of founders of Pre-Raphaelite Brotherhood. His earlier pictures dealt chiefly with hist. subjects, but he later devoted himself to painting Biblical and allegorical pictures, and became recognised as the greatest of modern religious artists. His *The Light of the World* is at Keble Coll., Oxford, *The Hireling Shepherd* and *The Shadow of Death* at Manchester, *The Triumph of the Innocents* at Liverpool.

HUNTER, JOHN (1728-93); Scot. surgeon, anatomist, and physiologist; *b.* (Feb. 13) at Long Calderwood, East Kilbride, Lanarkshire, the youngest of ten children. H. had but little schooling; in 1748 he became assistant in his bro. William's dissecting-room in London; later took charge of his bro.'s practical class, and attended Cheselden's lectures at Chelsea Hospital; a surgeon's pupil at St. Bartholomew's, 1751; surgeon's pupil, 1754 and house-surgeon, 1756, at St. George's Hospital; staff-surgeon in the army, 1760, serving in the Belle Isle and Portugal expeditions; retired, 1763 on half-pay, and commenced to practise as a surgeon in London, teaching, in addition, anat. and operative surgery. H. was elected F.R.S., 1767, obtained post of surgeon to St. George's Hospital, 1768, and began to take pupils, one of the first being Edward Jenner (*q.v.*). His reputation as a surgeon was now greatly increasing; app. surgeon-extraordinary to the king, 1776; built a museum and lecture-rooms for himself 1783-85; app. deputy-surgeon-general to the army, 1786; surgeon-general and inspector-general of hospitals, 1790; awarded the Royal Society's Copley medal, 1787, and on Pott's death, 1788, became acknowledged head of surgical profession in England; *d.* suddenly on Oct. 16, 1793. In 1859 his remains were transferred to Westminster Abbey.

HUNTER, ROBERT MERCER TALIAFERRO (1809-1887), an American statesman, *b.* in Essex co., Va. He practised law and at the age of 24 was elected to the State Legislature. He was elected to Congress in 1837 and strongly opposed Clay's protective policy. He was several times returned to Congress and served as Speaker of the House. He was elected U. S. Senator in 1847 and was re-elected until the outbreak of the Civil War, when he withdrew and became Confederate Secretary of State. At the close of the Civil War he served as Treasurer of Virginia.

HUNTER, WILLIAM (1718-83), Scot. physician and anatomist; elder *b.* of John Hunter (*q.v.*); ed. at Glasgow Univ., went to London, and commenced to lecture on operative surgery, 1746; afterwards including a course on anat., in addition to practising as a surgeon. He gave up surgery for obstetrics, being app. surgeon-accoucheur at Middlesex Hospital, 1784, and at Brit. Lying-in Hospital, 1749.

HUNTING is a sport of the highest antiquity; depictions of wild beasts with hunters in pursuit are found on Assyrian abd Egyptian sculptures. Hounds were in common use, while even lions were trained to follow game. The Greeks hunted big game on horseback or by trapping, and were particularly fond of harehunting. See XENOPHON'S CYNEGETICUS.

In mediaeval times the stag was extensively hunted by kings and nobles, and stringent forest-laws were passed by William I. and other rulers. It is still practised in Devonshire; powerful hounds are employed to track down quarry. Fox-hunting (*q.v.*) is found in most English-speaking lands. Otter-hunting is practised on foot with otter hounds; hunters are armed with spear. Beagles are employed in hare-hunting, which is quite different from coursing; owing to the timidity of the quarry, this is a sport which necessitates quietness.

Big-game hunting is a sport which, owing to its expense, can be followed by comparatively few.

HUNTINDGON.— (52° 20′ N., 0° 11′ W.), county town, Huntingdonshire, England, on Ouse; has XIII.-cent. grammar school and interesting churches; birthplace of Oliver Cromwell. Pop. 5,000.

HUNTINGDON, a borough of Pennsylvania, in Huntingdon co., of which it is the county seat. It is on the Juniata River. Its industries include the manufacture of boilers, sewer pipes, knit goods, etc. It is the seat of Juniata College. Pop. 1920 7,051.

HUNTINGDON, SELINA HASTINGS, COUNTESS OF (1707-91), Eng. religious worker; supporter of Methodism; founded chapels where Eng. Church liturgy was used, but her movement severed itself from Church of England, 1799; her *Connexion* still exists.

HUNTINGDONSHIRE (52° 29′ N.; 0° 15′ W.), midland co., England, bounded N. and W. by Northampton, S.W. by Bedford, E. by Cambridge. Surface mostly level, with slight risings in S.E. In N.E. is fen-district called Bedford Level. Chief towns, Huntingdon (capital), St. Ives, and Godmanchester. Principal rivers are Nene and Ouse. Chiefly agricultural county much pasture-land; wheat chief grain grown; market-gardening and fruit-growing, brewing, tanning, iron-founding, and manufactures of paper and parchment. Among places of interest are abbeys of Ramsey and Sawtry; priories at St. Ives and St. Neots; churches at Hartford, Old Fletton, Ramsey, and Alwalton; remains of palace at Buckden; ancient castles of Kimbolton and Huntingdon, and Hinchingbrook House, seat of Cromwell family. Pop. 1921, 54,745.

HUNTINGTON, a town of Connecticut, in Fairfield co., 13 miles W. of New Haven. Its industries include sawmills and other manufactures. Pop. 1920, 9,475.

HUNTINGTON, a city of Indiana, in Huntington co., of which it is the county seat. It is on the Wabash and Erie, and other railroads and on both sides o the Little River. It is the scene of an extensive coal mining and lime burning region and its abundant water power is utilized in its industries, which include railroad repair shops, lime and cement works, shoe, plough and barrel factories. The public institutions include a public library and a high school. Pop. 1920, 14,000.

HUNTINGTON, a town of New York, in Suffolk co., on Long Island, 32 miles N.E. of Brooklyn. It contains the village of Northport. It is a popular summer resort and residential section. Pop. about 12,000.

HUNTINGTON, a city of West Virginia, in Cabell co. It is on the Chesapeake and Ohio and the Baltimore and Ohio Railroads, and on the Ohio and Guyandotte rivers. It is connected by steamship lines with all the important river points. Its industries include the manufacture of railway cars, brick, machinery, ice, etc. Here are the railroad shops of the Chesapeake and Ohio railroads. The city is the seat of Marshall College, State Normal School, and Douglas Colored High School. It was named for the late Collis P. Huntington. Pop. 1920, 50,177.

HUNTINGTON, ARCHER MILTON (1870), an American editor and writer, *b.* in New York City, the *s.* of Collis P. Huntington. He was privately educated in this country and in Spain. He has edited *Lady Aulnoy's Travels Into Spain,* 1899; *The Poems of the Cid,* 1897 and he has written *A Note Book in Northern Spain,* 1898.

HUNTINGTON, COLLIS POTTER (1821-1900), an American capitalist, *b.* in Harwinton, Conn. Leaving his father's farm at sixteen, he traveled throughout the country selling clocks, then settled down in Oneonta, N. Y., as a merchant. In 1849 he went out to California by way of the Isthmus of Panama, with a stock of hardware, and prospered in San Francisco. In 1860 he and Leland Stanford and Charles Crocker formed a company which promoted the scheme for building the first trans-continental railroad, the Central Pacific R. R., which was completed in 1869. At the time of his death Mr. Huntington had seen this beginning develop into an organization of 26 subsidiary corporations, owning or controlling 9,000 miles of track and several steamship companies—the Southern Pacific R. R. Co., of which he was president.

HUNTINGTON, DANIEL (1816-1906), an American painter, *b.* in New York City. He studied art under Prof. Morse, president of the National Academy of Design, in 1835, later going to Florence and Rome, and returning to New York to establish a studio in 1845. He was president of the National Academy of Design during 1877-91. Among his portraits, in which he specialized, was one of Abraham Lincoln. One of his best paintings, 'Mercy's Dream,' is now hung in the Corcoran Gallery, Washington, D. C.

HUNTINGTON, ELLSWORTH (1876), an American geographer, *b.* in Galesburg, Ill. He graduated from Beloit College, in Wisconsin, in 1897, afrer which he spent four years in Harput, Turkey, as instructor in Euphrates College. At the end of this period he made an exploration of the shores of the Euphrates River which brought him distinction in the form of a medal

from the Royal Geographical Society of London. Since then he has explored extensively in Russian and Chinese Turkestan and India. He is the author of *Explorations in Turkestan*, 1905; *The Pulse of Asia*, 1907; *Palestine and Its Transformation*, 1911; *Civilization and Climate*, 1915; *World Power and Evolution*, 1919; *The Red Man's Continent*, 1919, and *The Principles of Human Geography* (with S. W. Cushing, 1920).

HUNTSVILLE, a town of Alabama, in Madison co., of which it is the county seat. It is on the Nashville, Chattanooga and St. Louis, and the Southern railroads. Its favorable situation makes it a much frequented summer and winter resort. Its industries include the manufacture of cotton, cottonseed oil, flour, and sawmill products. It is the seat of Goodrich Training School. State Agricultural and Mechanical Institute for Negroes, and an Infirmary. Pop. 1920, 8,018.

HUNYADI, JANOS (*c.* 1387-1456), Hungarian soldier and politician; instrumental in obtaining Wladislaus of Poland's election as king of Hungary; subsequently conducted war against Turks, whom he defeated at *Hermanstadt* and near Iron Gates of Danube, 1442; he was defeated at *Varna* in 1444, when the king was slain; during heir's minority H. acted as regent; in 1448 he was defeated by Turks at *Kossovo*, and in 1456, with support of Giovanni da Capistrano, he accomplished relief of Belgrade; *d.* in following month.

HUNYADI, LASCLO (1433-57), Hungarian statesman; executed through plot of his enemies; eldest *s.* of the great Janos.

HUNZA (36° 22′ N., 74° 50′ E.), and **NAGAR** (36° 6′ N., 74° 50′ E.), towns and small states, Kashmir, Brit. India.

HUON OF BORDEAUX, a hero of Charlemagne cycle of Fr. romances, H., Duke of Guienne, being one of Charlemagne's paladins.

HU-PEH (*c.* 31° N.; 113° E.), province, Central China; area, *c.* 71,410 sq. miles. Pop. 36,000,000.

HURD, ARCHIBALD (1869), Eng. journalist and writer on naval matters, has pub., among other works, *Naval Efficiency*, *The Command of the Sea*, *The British Fleet in the Great War*. Since 1899 has been on editorial staff of *Daily Telegraph*, and has contributed numerous articles to the *Fortnightly Reviews*, *Nineteenth Century*, etc.

HURD, RICHARD (1720-1808), Eng. ecclesiastic and author; bp. successively of Lichfield and Worcester; declined primacy; pub. *Letters on Chivalry and Romance*, *Dissertations on Poetry*, *An Introduction to the Prophecies*, etc.

HURLEY, EDWARD NASH (1864), an American public official, *b.* in Galesburg, Ill. With only a common school education he was for some years a railroad worker, being a locomotive engineer up to 1888, after which he was for a while a traveling salesman. He originated and developed the pneumatic tool industry in this country. In 1913 he was American trade representative to the Latin-American republics, later becoming chairman of the Federal Trade Commission. In 1917, during the war against Germany, he was appointed chairman of the U. S. Shipping Board and president of the Emergency Fleet Corporation, which position he held till 1919. He wrote *The Awakening of Business*, 1916, and *The New Merchant Marine*, 1920.

HURON, a city of South Dakota, in Beadle co., of which it is the county seat. It is on the Chicago and Northwestern and the Great Northern railroads. It is the center of an extensive agricultural and stock raising region and is the division headquarters of the Northwestern Railroad. Its industries include flour mills, machine shops, grain elevators, etc. It is the seat of Huron College and has a high school and other public buildings. Pop. 1920, 8,302.

HURON, LAKE, one of the great lakes of North America, in the basin of the St. Lawrence River. It is second in size only to Lake Superior. In position it lies between Lake Superior and Lake Michigan on the N. W. and W. and between Lake Erie and Ontario on the S. and S.E. It is surrounded on the W. and S.W. by the State of Michigan and on all the other sides by the province of Ontario. It is divided in two parts by a long peninsula and a chain of islands. On the N. and E. the parts are called North Channel and Georgian Bay. Its total length is about 280 miles and its greatest breadth about 190 miles.

HURONS, members of tribe of N. Amer. Indians, who inhabited shores of Lake H., but were early exterminated.

HURRICANE, violent storm, with rain, thunder, and lightning, common in West Indies and other places during autumn months.

HURST, FANNIE (1889), an American author, *b.* in St. Louis, Mo. She graduated from Washington University in 1909, then spent several years among the working people, being at one time a

saleswoman in a department store and again making a steerage passage across the Atlantic. Her novels, which have been extremely popular, deal with life among the Jewish working people. She has written *Just Around the Corner*, 1914; *Every Soul Has Its Song*, 1915; *Gaslight Sonatas*, 1916; *Humoresque*, 1918; *Star Dust*, 1919, and *The Vertical City*, 1921. She has also written two plays: *The Land of the Free*, 1917, and *Back Pay*, 1921.

HURST, JOHN FLETCHER (1834-1903), an American Methodist bishop, *b.* near Salem, Md. He graduated from Dickinson College (Carlisle, Pa.), in 1854 studied theology in Germany, held pastorates in New Jersey and New York and became a bishop in 1880. During 1891-1902 he was chancellor of the American University, in Washington, D.C. He is the anthor of *A History of Rationalism*, 1965; *Our Theological Century* 1876 and *A History of Methodism*, 1904.

HUSBAND, originally the owner of the house (A.-S. *hus*), with feminine 'housewife' (A.-S. *huswif*); general idea of a caretaker developed from this meaning.

HUSBAND AND WIFE. See MARRIAGE.

HUSBAND, WILLIAM WALTER (1871), Commissioner general of immigration. *B.* at East Highgate, Vt. Educated in Vermont. 1900-1902 reporter for St. Johnsbury Caledonia, 1902-1903 managing editor for Montpelier Daily Journal; 1903-1907 clerk of United States Senate Committee on Immigration; 1907-1911 executive secretary on United States Immigration Committee; 1911-1913 chief of contract labor division, United States Bureau o) Immigration; 1913 represented United States Department of Labor in Europe; 1916-1917 editor Immigration Journal; 1917-1919 with American Red Cross in Europe; 1918-1919 on Interallied Repatriation Commission. Since 1921 commissioner general of immigration. Author of: *Emigration Conditions in Europe* (Reports of United States Immigration Commission, Government Printing Office.,) 1911.

HUSBANDRY, PATRONS OF, also known as the Grange, an American organization of farmers. In 1866 the U. S. Department of Agriculture sent one of its agents, O. H. Kelley, to investigate the condition of the farmers in the South. Finding them in an extremely impoverished situation, he attempted to afford them constructive assistance by organizing them. Thus, in 1867, were organized the first 'granges' of the American Patrons of Husbandry. At first the progress made was slow, but in 1872 the organization took on a sudden spurt and began spreading all over the country, especially in the Middle West. In 1873 there were 10,000 local granges, and in 1875 the total membership stood at 1,500,000. The object of the order was to secure better economic conditions for the farmers through joint action, and in the endeavor to accomplish this it gradually drifted into politics. In 1892 the organization backed the Populist Party, by a large majority, and when that political party disintegrated, the Grange suffered heavily, its membership dwindling to negligible quantities. During the past few years, since the close of the war against Germany, it has been recovering somewhat. In Washington State the local granges are engaged in a very successful co-operative enterprise, known as the Grange Warehouses, Inc.

HUSKISSON, WILLIAM (1770-1830), Brit. financier and politician; Sec. of Treasury, 1804; pres., Board of Trade, 1823; Colonial Sec., 1827. Advocated free trade, and secured reduction of import duties.

HUSS, JOHN (*c.* 1373-1415), Bohemian religious leader, of peasant family: studied at Prague Univ., where he lectured, becoming rector of Behtlehem chapel, 1402. H. studied Wycliffe's writings, and gradually adopted unorthodox views; proceedings taken against him, 1408; forbidden to preach or perform priestly duties; elected rector of Univ., 1409, but this led to further proceedings against him; excommunicated, 1410, and writings burnt; after further troubles obliged to leave Prague in 1412, and wrote *De Ecclesia*. In 1414 he went to the general council at Constance to defend his views, being granted a safe conduct from King Sigismund; after lengthy trial condemned July 6, 1415, and, refusing to recant, burnt. Continuing the work of Wycliffe, H. helped to prepare the way for the Reformation.

HUSSAR, name originally given in 1458 to Hungarian light cavalry soldiers; name means 'twenty,' since one man in twenty was chosen for service.

HUSSEIN IBN ALI (1851), first King of the Hedjaz, belongs to family of the Katada in which sherifate of Mecca has been vested for eight centuries; recognized by Mohammedans as senior descendant of Mohammed. From 1890 to 1908 lived as an honored prisoner at Constantinople, where he gave his four sons, Ali, Abdullah, Feisal, and their half-brother Zeid, a modern education. After Turk.

revolution, 1908, was appointed Grand Sherif and Emir of Mecca by Committee of Union and Progress, and gained great influence over surrounding Arab tribes. Refused to proclaim Holy War on behalf of Germany, and was invited by nationalist societies in Syria and Mesopotamia to lead Arab revolt. For the history of this revolt and his subsequent intervention in the war on the side of the Allies, see ARABIA. On Oct. 29, 1916, was proclaimed King of Hedjaz with concurrence of the ulema sheikhs, title being subsequently recognized by all the Allies. While Feisal and Zeid led his northern army victorious into Syria and Ali and Abdullah blockaded Medina, he set himself vigorously to organize his new kingdom. Was represented at Peace Conference by Feisal. See HEDJAZ.

HUSSITES, religious party in Bohemia, named from John Huss (*q.v.*), soon after whose death they arose. The special conditions of Bohemia aided them; the avarice and corruption of its priests was infamous, and the Slav peasantry disliked Ger. domination. The H's split into two groups—the *Utraquists* (or *Calixtines*), those whose main claim was communion in both kinds, and the *Taborites*, who were extreme. Continual fighting took place between these two and also with Ger. troops. As it seemed impossible to crush them, a treaty was signed by the H's, Rom. delegates, and King Sigismund, the main clause of which allowed communion in both kinds. This concession continued till 1620. The H's were mostly absorbed in Protestantism at the Reformation.

HUSTING, early Eng. court, of which traces are found in the old Danelagh; it survived as the county court of London city, and gave its name to election platforms.

HUTCHESON, FRANCIS (1694-1746), Brit. theologian and metaphysician; *b.* N. of Ireland; ed. Glasgow Univ., 1910-16; became minister of a dissenting congregation in Dublin, and established a school; though a dissenter, he was on good terms with the bp's of the Irish Church; in 1729 became prof. of Moral Philosophy at Glasgow; many Eng. and Irish dissenters came to study under him. His writings deal with metaphysics, logic, and ethics, of which the last are best known. H. held man has a number of senses—consciousness, sense of beauty, a public sense, a moral sense, sense of the ridiculous, etc., of which the 'moral sense' is fundamental. His philosophy follows Locke in many points (not in all), and is in opposition to Hobbes.

HUTCHINSON, a city of Kansas, in Reno co., of which it is the county seat. It is on the Atchison, Topeka and Santa Fe, the Chicago, Rock Island and Pacific, and the Missouri, Pacific and other railroads, and on the Arkansas River. The city is within one of the largest salt mining areas in the world. It is also an important meat packing and shipping center. Its other industries include the manufacture of lumber, machinery, boilers, etc. It is the seat of the State Reformatory, and has a public library and a high school. Pop. 1920 23,298.

HUTCHINSON, ANNE (1600-43), religious fanatic; *b.* in England; *m.* and emigrated to America, 1634; caused a schism in Boston congregation and was excommunicated.

HUTCHINSON, SIR JONATHAN (1828-1913), Eng. surgeon; prof. of Surgery and Pathology at Royal Coll. of Surgeons, 1877-82; pres. Royal Coll. of Surgeons, 1889; founder of the London Postgraduate School of Med.; made important researches in different branches of med., particularly regarding leprosy, and on which he became the greatest living authority; author of numerous works on medical subjects.

HUTCHINSON, THOMAS (1711-80), Brit. gov. of Massachusetts; constrained to order Brit. troops from Boston, 1770; Loyalist gov. of Massachusetts, 1717-74, though not in sympathy with government actions; superseded by Gage.

HUTCHINSON, WOODS (1862), physician, *b.* at Yorkshire, England, 1880, Bachelor of Arts, 1883, Master of Arts, Penn College; 1884 Doctor of Medicine, University of Michigan; 1884, began practice of medicine; 1891-1896 professor of anatomy, State University of Iowa; 1896-1900 at University of of Buffalo, professor of comparative pathology; 1903-1905 state health officer of Oregon; 1907-1909 clinic professor of medicine at New York Polyclinic; 1899-1900 at London Medical Graduates' College, lecturer on comparative pathology; 1899-1900 lecturer on biology, extension department, University of England. Author of: *The Gospel According to Darwin*, 1898; *Studies in Human and Comparative Pathology*, 1901; *Play as an Education, Acromegaly and Gigantism, Health and Common Sense*, 1908; *Preventable Diseases*, 1909; *Conquest of Consumption*, 1910; *Exercise and Health*, 1911; *Exercise and Health*, 1918 and many other books.

HUTCHINS, HARRY BURNS (1847,) an American University President, *b.* in Lisbon, N. H. He grad-

uated from the University of Michigan, in 1871, was Jay professor of law there during 1884-7; professor of law at Cornell University during 1887-94; and was president of the University of Michigan from 1910 to 1920, since then being president emeritus.

HUTTEN, ULRICH VON (1488-1523), Ger. humanist and reformer; first trained as monk, but left in disgust; from 1504-15 wandered about Germany and Italy; author (in part) of famous *Epistoloe Obscurorum Virorum*; attacked Papacy and quarrelled with Erasmus, but was received by Zwingli; a passionately sincere reformer, but a man of dissolute life, headstrong, and lacking in self-control; wrote much in Latin and German.

HUTTON, CHARLES (1737-1823), Eng. mathematician, taught at Newcastle till 1773; then prof. of Mathematics at Woolwich. Pub. *Mathematical Tables*, 1785, *Mathematical and Philosophical Dictionary*, 1795-96; *Course of Mathematics*, 1798 and 1811.

HUTTON, JAMES (1726-97), Scot. geologist; ed. Edinburgh High School and Univ.; abandoned study of law for that of medicine; took M.D. (London) 1749; began study of geology as hobby and put forward theory that geology is not cosmogony; studied also atmospheric changes and several branches of physics.

HUTTON, RICHARD HOLT (1826-97), Eng. miscellaneous prose writer and edit.; joint-edit. of the *National Review*, 1855-65, and of the *Spectator*, 1861 onwards.

HUXLEY, THOMAS HENRY (1825-95), one of the greatest of Eng. zoologists and biologists; *b.* at Ealing in 1825; app. assistant-surgeon on H.M.S. *Rattlesnake*. During the four years' cruise in Australian seas, he studied the delicate surface fauna of the ocean. The result was the forsaking of medical for biological science. From 1854 till he retired in 1885, H. was palaeontologist and lecturer on Natural History at the Royal School of Mines.

Keen as he was on scientific research, H.'s mind was essentially practical, and he labored strenuously in popular lectures and 'Lay Sermons' to make abstruse science—the Evolution Theory of Darwin in particular—clear to the people. He was a member of the Fisheries Commission and of the London School Board; he was a constant critic of political and social progress, and a bitter opponent of all narrowness of thought. More than any of his predecessors, he made the study of zoo. in the univ's a practical training instead of an accumulation of hearsay information.

From examining the anatomy and relationships of Medusae, he wandered to Vertebrate Anat., where he discussed the structure and origin of the skull, the characters of fossil Ganoid Fishes, and the systematic arrangement of Birds. Besides his printed lectures and essays, he wrote many masterly general works, e.g. *Man's Place in Nature*, 1863; *Lessons in Elementary Physiology*, 1866; *Aant. of the Invertebrates*, 1870 and *The Crayfish*, 1881.

HUY (Flem. *Hoey*), town, on Meuse Belgium (50° 32′ N., 5° 15′ E.), distilleries; paper-mills. Captured by Germans after resistance by civil guard (Aug. 12, 1914). Pop. 14,500.

HUYGENS, CHRISTIAN (1629-95), Dutch mathematician; studied civil law at Leyden, Breda, and Paris; investigadated oscillations of pendulum and was first to show Saturn's ring surrounds planet; measured its inclination to ecliptic; was founder of undulatory theory of light; in *Traite de la lumiere*, 1690 gave explanation of reflection and refraction. Discovered polarisation of light.

HUYGENS, SIR CONSTANTIJN (1596-1687), Dutch poet and statesman; best works are *Batara Tempe*, *Dagwerck* (a didactic poem), and *Oogentroosi* (a consolatory poem).

HUYSMANS, JORIS KARL (1848-1907), Fr. novelist, whose realism is mixture of Zola with Maupassant, without the latter's polish; later works are psychological studies of religious experiences.

HUYSUM, JAN VAN (1682-1749), Dutch painter of wonderful vases of fruit, flowers, butterflies, etc.; considered master of this kind of painting.

HYACINTH, a genus of monocotyledonous plants; natural order, *Liliaceoe*. The hyacinth, *Hyacinthus orientalis*, is a perennial herb with a bulb. Foliage-leaves are long, narrow, parallel-veined, with sheathing bases. A bare stem terminates in a raceme of pendulous brightly colored flowers in the axils of bracts; three petaloid sepals and three petals form a single tube with six free segments.

HYACINTH, JACINTH, red stone used by ancients as ornament; variety of Zircon.

HYACINTHUS (classical myth.), beautiful youth slain accidentally by Apollo; from his blood grew Gk. hyacinth (clearly not our flower of that name), inscribed with exclamation of

woe, 'Ai!' Great Spartan midsummer festival, the *Hyacinthia*.

HYADES, in Gk. myth.; seven maidens who watched over Dionysus; changed by Zeus into stars and placed in constellation Taurus.

HYBLA MINOR (mod. Paterno) (37° 32′ N., 14° 53′ E.), ancient city, Sicily, on S. slope of Mt. Etna.

HYBRIDS.—One of the chief causes of the separation of species of animals and plants has been the fact that members of a species are fertile, amongst themselves, but are not fertile with members of another species. This rule is not universal, however, for occasionally species are found which interbreed with other species, the progeny of such a union being known as hybrids, and the phenomenon as hydridism. But it must be remembered that where hybridism occurs the species concerned are *closely* related, for while a Hare and a Rabbit may interbreed occasionally, it is absurd to think of either breeding with a Porcupine, although distantly related in the same natural order of Mammals. Another general fact is that hybrids are seldom fertile amongst themselves, although there is no apparent reason why this should be so. Mules—the offspring of horses and asses—are infertile with each other, but sometimes produce young when mated again with the pure parental forms. In the animal world hybrids seem to occur in nature not infrequently amongst deer, game-birds, ducks, and fishes, *e.g.* Roach mating with Bream or Rudd, and Carp with Tench or Bream. And artificial hybrids among these and many others, such as the species of such lowly creatures as Sea Urchins, are not uncommon. In the vegetable world the artificial crossing or hybridising of species of plants has led to many new forms. It is unfortunate, for clearness' sake, that the word 'hybrid' is used for the progeny not only of two species, but also of two varieties of one species, when the word 'mongrel' would have indicated the latter class more distinctly. Varietal mongrels or hybrids are so much under man's control and have given rise to so many useful breeds, that they are of the utmost importance.

HYDE (53° 27′ N., 2° 5′ W.), town, Cheshire, England; cotton manufactures; coal mines. Pop. 35,000.

HYDE, DOUGLAS (1863); Irish literary historian, poet, and folklorist, known as 'An Craoibhin Aoibhinn' (Delightful Little Branch), has played a large part in the revival of Gaelic language and literature; founder of Gaelic League, and its president up to the rise of Sinn Fein and the intrusion of politics, 1915. Works include a *Literary History of Ireland*, 1899; *Love Songs of Connacht*, 1906, and short plays for Irish-speaking actors.

HYDE, WILLIAM DEWITT (1857-1917), an American college president, *b.* in Winchendon, Mass. He graduated from Harvard, in 1879, studied theology at Andover Theological Seminary, held a pastorate in Paterson, N. J. and became president of Bowdoin College in 1885. In this capacity he showed marked administrative ability, developing the institution into one of the best in the country. He wrote *Practical Ethics*, 1892; *Practical Idealism*, 1897, and *The Gospel of Good Will*, 1915.

HYDER ALI, HAIDAR ALI (*c.* 1722-82), famous soldier; native of India, who became Maharajah of Mysore; conquered Calicut and other native states; formed alliance with French, and took Arcot in 1769; defeated in several engagements by Sir Eyre Coote, 1781.

HYDE PARK, a town of Massachusetts, in Suffolk co., 8 miles S. of Boston. It is on the Neponset River and the Boston and Maine Railroad. It is chiefly a residential place but has important manufactures. Pop. about 15,000.

HYDE PARK, a famous park in London, which contains about 400 acres. On the W. is Kensington Gardens. The park has for many years been a fashionable promenade. It contains Rotten Row, a road set apart for equestrians, and the Serpentine, a large body of water. The Albert Memorial, in memory of the Prince Consort, is in Hyde Park.

HYDERABAD, HAIDARABAD (17° 50′ N., 78° 40′ E.), principal native state in India, lying between provinces of Madras and Bombay in the Deccan; area, *c.* 82,700 sq. miles; capital, Hyderabad. Country fertile, but badly cultivated. Tableland traversed by the Godavari in N., and Kistna in S.; climate healthy; chief products are rice, wheat, maize, cotton, etc. Nizam and State are Muhammadan; otherwise mostly Hindu. Pop. *c.* 11,500,000.

HYDERABAD, HAIDARABAD (17° 21′ N., 78° 30′ E.), city; capital of above state; surrounded by walls; principal buildings are the Mecca mosque and Brit. Residency; fourth largest city and one of chief seats of Muhammadanism in India; important commercial centre; extensive water-works. Pop. 42,000.

HYDERABAD, HAIDARABAD (15° 23′ N., 68° 24′ E.), city; capital, Hydera-

bad, Scind, Bombay, Brit. India; near E. bank of Indus; strongly fortified; manufactures silks, gold-work. Pop. 71,000.

HYDRA, in Gk. legend, nine-headed monster inhabiting Lerna in Argolis slain by Heracles.

HYDRA, ancient *Hydrea* (37° 20′ N., 23° 30′ E.), small island on S.E. coast of Argolis, Greece; took prominent part in the Gk. war of independence; contains seaport of H.; active trade. Pop. 20,000.

HYDRANGEA, a deciduous shrub, *Hydrangea hortensia,* with oval, strongly veined opposite leaves. The *inflorescence* is a *corymb* of pink or blue flowers; the petals are absent and speals are petaloid.

HYDRATES are compounds, including salts, containing water of crystallization, where water molecules do not undergo rearrangement.

HYDRAULIC ENGINES are machines designed to convert into mechanical energy, the kinetic energy of moving water or the potential energy of water under pressure. Under this heading are classified Water Pressure Engines, Water Wheels, Water Turbines, Water Motors, Hydraulic Rams, etc.

Water Pressure Engines usually consist of long cylinders in which the water acts on a piston; this in turn acts on the load. Typical examples of this engine may be seen in hydraulic elevators, hydraulic presses, etc.

Water Wheels are of three types: 1—the overshot wheel, with the water entering the buckets of the wheel on top; 2—the breast wheel, in which the water enters the buckets at about the same level as the wheel axis; 3—the undershot wheel, in which the velocity of a stream of water drives the wheel by impinging on its blades. Water wheels are commonly used to drive small grist mills, saw mills, cider presses, etc.

Water Turbines are classified as Impulse Turbines, when all the energy of the water is changed to kinetic energy before it acts on the turbine runner, and as Reaction Turbines when only part of the energy is converted into kinetic energy before entering the turbine buckets. This class of hydraulic engine is widely used to drive electric generators, where the head of water or discharge is high.

Water Motors, built somewhat on the lines of a reciprocating steam engine, take water at a pressure and utilize its potential energy. The velocity of the water is kept as low as possible. The efficiency of this device being only about 50%, they are seldom used.

Hydraulic Rams utilize the kinetic energy of a stream of water in a pipe to force a smaller quantity of water to a height greater than that of the head on the ram. The efficiency of this device is rather low, but its convenience, simplicity and the absence of moving parts (except valves), renders it quite popular in rural districts for supplying water for domestic purposes for a comparatively low water fall.

A Hydraulic Engine, utilizing pulsations in a closed pipe system has been proposed. The pulsations are imparted to the incompressible water by a pump-like apparatus; the motor also resembles a valveless pump. In this system there is no flow of water, the pulsations transmitting the energy. Its future however is doubtful since other power transmitting systems are more efficient and convenient.

HYDRAZINE, DIAMIDOGEN ($H_2N.NH_2$), is a colorless liquid, B.P. 113°·5 C., formed by complex organic decomposition. It is heavier than and soluble in water, and at 0° C. forms colorless crystals. It reacts vigorously with the *halogens* and is a strong reducing agent.

HYDROCARBONS. A large group of compounds composed of hydrogen and carbon combined in varying proportions. The three principal groups of hydrocarbons are known as (1) saturated (2) unsaturated, (3) hydrocarbons containing a ring structure. Saturated hydrccarbons are those in which all four valencies of the carbon atom are satisfied. They have the general formula C_nH_{2n+2}. The paraffins belong to this group, including marsh gas, CH_4, which is the simplest hydrocarbon known, and most of the constituents of petroleum oil. Unsaturated hydrocarbons, having the general formula C_nH_{2n}, or C_nH_{2n-2}, contain unsatisfied carbon bonds and will therefore unite directly with other elements, such as chlorine, without any disturbance of the hydrogen atoms in the molecule. One of the best known of the unsaturated hydrocarbons is acetylene, C_2H_2. Others are ethylene, C_2H_4, propylene, C_3H_6, butylene, C_4H_8. The hydrocarbons of ring structure include a number of compounds of great commercial importance, among them being benzene, C_6H_6, toluene, C_7H_8, naphthalene, $C_{10}H_8$, anthracene, $C_{14}H_{10}$. Combination of one type with another frequently occurs in nature, so that the number of natural hydrocarbons is enormous. Decaying vegetable and animal matter, under favorable conditions, gives rise to hydrocarbons, natural gas and coal gas consist largely of them, and petroleum and shale oils are made up almost entirely

of a mixture of hydrocarbons of varying complexity.

HYDROCARBONS, BENZINE. See BENZINE HYDROCARBONS.

HYDROCELE, collection of fluid, usually serous, in vicinity of the testis or spermatic cord, commonly due to chronic inflammation, perhaps syphilitic, of testis, manifested as a fluctuating swelling of the scrotum with a dragging feeling; treated by slight operation of tapping, injecting various substances, or excising part of tunica vaginalis and draining.

HYDROCEPHALUS, condition of brain in which the ventricles or cavities are distended with fluid, due either to malformation or to chronic inflammation it is either congenital or develops in the first few months of life, and the upper part of the head is increased in size out of proportion to the rest of the body; the brain may be pressed on by the fluid, so that the intelligence is impaired, and hydrocephalics do not usually live long. Treatment is unsatisfactory, and best is merely maintenance of the health of the individual with nourishing foods and tonics.

HYDROCHLORIC ACID (HCl), colorless gas, liquefying under cold and pressure, liquid boiling at —83·6 C.; when dry, inactive with metals; readily soluble in water, saturated solution at 15° C. having S.G. 1·21; solution called Muriatic Acid, Spirits of Salt; manufactured by strong sulphuric acid on common salt (see also ALKALI); commercial a. is yellow and used for making bleaching powder and in soldering; forms chlorides.

HYDROCYANIC ACID, PRUSSIC ACID.

HYDRO-DYNAMICS. See HYDROMECHANICS.

HYDROGEN (H=1) is a tasteless, odorless, and colorless gas. It is the lightest known substance and therefore constitutes the standard of *Atomic Weight* and *Valence.* At—253° C. it is a colorless liquid. *Hydrogen* burns in air and oxygen with a non-luminous blue flame. It is prepared— (1) by the action of metals on water, different metals abstracting the oxygen at cold, moderate, and high temperatures; (2) by the action of a suitable acid on a suitable metal. All acids contain *hydrogen. Hydrogen,* either as a gas at a high temperature, or in the nascent condition at ordinary temperature, is a reducing agent, for it abstracts *oxygen* from compounds. A mxiture of *hydrogen* and *oxygen* when ignited unite with explosive violence to form water. The position of *hydrogen* in the *periodic* system is not definite. As a univalent element it must be placed at the head of either the alkali metals or the halogens, but it resembles neither closely.

HYDROGEN PEROXIDE (H_2O_2); unstable viscid liquid obtained by combination of hydrated peroxide of barium and sulphuric acid (dilute); strong oxidising agent employed largely in bleaching and dyeing.

HYDROGRAPHY. See MAP.

HYDROMECHANICS is the study of the dynamical properties of fluids and their application as motive power for machinery. *Hydrostatics* is the study of fluids in equilibrium or at rest. *Hydrodynamics* is concerned with fluids in motion. For these purposes. a fluid is defined as any substance which can yield continuously to any force which tends to divide it along any plane. If through any body we draw an imaginary plane surface, the stress (tension, pressure, or shearing force) acting across this plane can be resolved into two components—one perpendicular to, the other along the plane. In a solid, both components may be present; in a fluid at rest, the perpendicular component alone can be present. Fluids, therefore, include both liquids and gases.

The basis for the first division of the subject—*Hydrostatics*—is given by the principle just enunciated, that in a fluid at rest the stress in any plane drawn through the fluid must always be normal to that plane. This stress generally takes the form of a pressure, which is measured *at* any point by the thrust or pressure exerted over unit area including the point. It may be expressed in atmospheres, pounds weight, or tons weight per square inch or square foot, or (if the C.G.S. system be adopted) in dynes per square centimetre. The principal theorems of hydrostatics may be summarized as follows, it being understood, of course, that they apply to fluids *at rest* or *in equilibrium*: (1) The pressure at any point of a fluid is the same in all directions. (2) Pressure is transmissible from one point to another in the same mass of fluid—*i.e.,* any additional pressure applied to an incompressible fluid will be transmitted equally to every point of the fluid. (3) In liquids acted on by gravity, the pressure is uniform over all points in the same horizontal plane, and therefore the free surface of a liquid at rest under gravity is a horizontal plane. (4) The pressure at any point in a homogeneous liq id acted on by gravity is proportional to the depth of the point below the free

surface; hence liquids 'find their level,' as the saying is, and where two liquids do not mix, their surface of separation is a horizontal plane. (5) The pressure on any plane area immersed in a fluid is equal to the weight of a column of the liquid whose cross-sectional area is equal to the immersed area and whose height is equal to the depth below the free surface of the centre of gravity of the immersed area. (6) Any body which is wholly or partially immersed in a fluid acted on by gravity experiences an upward thrust equal in amount to the weight of fluid displaced by the body, and this thrust acts vertically upwards through the centre of gravity of the displaced fluid (*Archimedes' principle*). (7) In order that a body floating freely in a fluid may be in equilibrium, the condition involved in (6) above must be satisfied, and, further, the centres of gravity of the displaced fluid and of the floating body must lie in the same vertical line.

These theorems (for the proofs of which the reader is referred to any treatise on the subject) have a very extensive application in the sciences, arts, and industries, and we have only space to mention a few in illustration. The transmissibility of fluid pressure is applied to the conveyance of power from one point to another. At a central station, hydraulic presses or accumulators apply pressure to a body of water; pipes in communication with the presses convey the pressure to cranes, motors, lifts, and other hydraulic machines The principle that water finds its own level is familiar to all. The variation of pressure with depth is the principle of Hare's Hydrometer, and of similar methods of determining the density of liquids. It is also illustrated by the diminishing pressure of the atmosphere as we ascend from sea-level, but in this case the rate of diminution is complicated by the fact that air is compressible. In the case of the water in an ocean, the proportionate increase of pressure with depth is more nearly correct, owing to the low compressibility of water. The expression given in (5) above for the total thrust on an immersed surface is constantly in use for calculating the stresses on dock gates, reservoir walls, dams. and other immersed surfaces.

Archimedes' principle, taken together with the conditions of equilibrium given in (7), introduces the whole question as to the equilibrium of ships, submarines, diving-bells, caissons, balloons, and all other bodies which are supported vertically by the upward thrust of the fluid in which they are wholly or partially immersed. In this connection, the question of *stability* of equilibrium of a floating body arises, and thus introduces matters of the utmost importance in naval architecture. The principle of Archimedes also forms the basis of a method for ascertaining the *specific gravity* of a body. For if the upward thrust of a body when totally immersed in water is equal to the weight of an equal volume of water, the weight of the body when weighed in water will be diminished by this amount. Hence the ratio of the weight of the body to the difference between the weights in water and air gives the specific gravity. Obviously, also, the ratio of the diminutions in weight of the same body when weighed in a given liquid and in water is equal to the specific gravity of the liquid. In the case of a body specifically lighter than water, it floats in water with that proportion of its whole volume immersed which equals the specific gravity of the body. This is the basis for the construction of *hydrometers*, which are used to give direct readings of the specific gravity of liquids.

In *Hydrodynamics*, we start with the assumption that liquids are perfect—*i.e.*, that the relative motions of their parts are not impeded by viscous friction. There is no liquid in nature which satisfies this condition, but in many liquids the effects of viscosity are so slight that they may be neglected. Later on in the treatment of the subject, the equations of motion are modified so as to allow for viscosity, but their complicated character has rendered their solution difficult except in a few simpler cases. It is not possible to give here any explanation of the hydrodynamical equations, but one or two of the leading ideas connected with them may be mentioned. The motions of a fluid may be treated in two ways. We may fix attention on a given volume of space and take into account the amounts of fluid which enter or leave that space. Or we may choose a certain small volume of the liquid and study the changes which, during its motion, it may undergo in shape, position, speed, pressure, etc. In either case we are led to the equations which describe the motion of the fluid. The whole mass may then be mapped out by lines which at each point have the same direction as the velocity of the fluid at that point. These are termed *lines of flow*, or *stream-lines*. Following the gravitational analogy, according to which water, in flowing down a hillside, always takes the steepest possible course, we can draw a series of surfaces in the fluid such that they are always at right angles to the stream-lines.

Such surfaces are termed *surfaces of equivelocity potential*, and the fluid will always move from places of higher to

places of lower velocity potential. The term *irrotational* is applied to those species of fluid motion in which a velocity potential exists, in order to distinguish them from cases of rotational or vortex motion where such potential does not exist. Another way of looking at irrotational motion is to imagine that each stream-line begins at some point where fluid is continuously produced and ends at some point where it is continuously annihilated—that is, to start from a *source* and end at a *sink*. In rotational or vortex motion, a cylindrical portion of the fluid of very small diameter is in rotation about its axis. Such motion is accompanied by a tension between the ends of the vortex and a pressure on its cylindrical surface or boundary. It can be proved that, in a perfect fluid, vortex motion cannot be created, and if in existence it cannot be destroyed. In a viscous fluid, however, vortices can be produced; but if left to itself without a supply of energy from without, the vortex is destroyed in time by the viscous forces in the fluid.

HYDROMETER is an instrument for determining the *density* of liquids and solids. It is an application of the principle that when a body floats in fluid under the action of gravity the weight of the body is equal to that of the fluid dispiaced. Boyle was the first to employ h's. A h. consists of a glass bulb with a long stem sealed and graduated. The bulb is weighted with mercury or small shot, a sufficient vuantity being used to immerse the whole of the bulb in the heaviest liquid in which it is to be used. The height and diameter of the stem must be such that the h. will float in the lightest liquid in which it is to be used. The point to which the h. sinks in the lightest liquid, and that to which it rises in the heaviest liquid, are then marked on the stem with the densities of these liquids, and the distance between graduated. The *density* of any liquid not greater or less than those marked on the stem can be obtained by placing the h. in a tall cylindrical vessel full of the liquid and reading the mark to which it sinks. Care must be taken that no air-bubbles adhere to its surface and that it does not touch the sides of the vessel.—Nicholson's Hydrometer, made of metal, has a pan above and below the bulb and only one mark on the stem. From these pans the weights in air and water of a solid are obtained, and the formula weight in air divided by weight in water is the required density.

HYDROPATHY, the treatment of disease by pure water, is a method which has been employed since ancient times, Hippocrates, Galen, and other classical medical writers praising it highly. In the XVIII. cent. water began to be used externally and internally for fevers, and Priessnitz, 1799-1851, a farmer at Gräfenberg, Silesia, treated sprains, wounds, and many other conditions, with great success, by applying water to every part of the body; and during the first half of the XIX cent. treatment by water became very popular, hydropathic establishments springing up in numbers in England, France, Germany, and America. Water is best drunk about an hour before meals; only very little, and that hot, during meals; while early in the morning and late at night, water is benefit in flushing out the stomach and bowels. In the form of steam, water has a valuable effect in irritation or inflammation of the respiratory passages and lungs. The methods of applying water externally to the body include hot or cold packing, for cooling or inducing sweating; hot-air baths (Turkish) to stimulate the nervous and vascular systems and for the treatment of gout and rheumatism; spray, shower, plunge, douche, needle baths, having a stimulating and tonic effect on the system; sitz, head, and foot baths. for local congestions and inflammations; and hot and cold fomentations or poultices for numerous local conditions, wounds, sprains, etc.

HYDROPHOBIA, an infectious disease occurring among certain animals, particularly dogs and other animals of the canine species, and communicable by them to man, infection being most usually carried by a bite of a rabid animal. The first symptom of the disease in a dog is a change in its habits; it is gloomy and restless; the restlessness increases, the animal snaps at everything and tears up and swallows all kinds of unusual things; the eyes are dull, the mouth continually open, and it has a characteristic high-toned bark; it becomes much excited in the presence of another dog and tries to attack it; gradually convulsions, paralysis, and coma come on and death ensues.

In man the incubation period is from abont a fortnight to seven or eight months, bnt six weeks is the average period. The first symptoms are mental depression and restlessness, sleeplessness and nervous excitability; the symptoms become worse and the person suffers much from thirst, but on making the effort to drink is seized with a spasm of the muscles of swallowing and breathing; these and other paroxysms increase in severity, then weakness and paralysis develop, convulsions and coma ensue, and result in death.

The former treatment was to excite the part infected or to apply to it a

caustic or the actual cautery, but the researches of Pasteur have revolutionised the treatment. It depends on the fact that a virus can be extracted from the tissues of a rabid animal and then either attenuated or intensified. The spinal cords of rabbits which have been inoculated are dried for different periods, the diminution of virulence being proportional of the length of time they are kept, and emulsions made from them are injected into the individual affected, the strength of the virulence of the emulsion being gradually increased up to the standard strength. An individual so treated does not exhibit any symptom of hydrophobia.

HYDROPLANE is, strictly speaking, a craft which, under power, skims along the surface of water. The bottom is so constructed with planes that when movement starts the craft rises to and then skims along the surface. The term is also often applied to what is more correctly described as the *hydro-aeroplane* This is an aeroplane fitted with a base in the form of a pontoon or boat with a hydroplaning bottom. When under power, the base is lifted to the surface by the combined aeropiane and hydropiane action. It may then be controlled as a hydroplane.

HYDROSTATICS. See HYDROMECHANICS.

HYDROXIDES, compounds containing hydrogen and oxygen not in form of water, thus differing from hydrates (*q.v.*); mostly basic in action; common h. is Sodinm H. (NaOH).

HYDROXYLAMINE, HYDROXYAMMONIA ($NH_2.OH$), is a liquid which with acids forms salts; prepared by acting on nitric acid with nascent hydrogen.

HYDROZOA, the name given to a class of Coelenterata belonging to the sub-.hylum Cnidaria; it is coincident with Hydromedusae or Craspedota, with the addition of the Acalephae. This class includes polyps, colonies of polyps which produce medusae by budding, and medusae which rise directly from the egg. The polyps, which are small in size, are generally attached permanently to foreign bodies ,but sometimes as in Siphonophora, the whole colony may be free-swimming. The first polyp assumes an upstanding position termed the hydranth, which lengthens and buds until it forms a colony or hydrosome. The generative cells, which are always ripening and discharging, may arise in a variety of places, but always migrate to the ectoderm of the gonophore. H. feed chiefly on animal substances, and with few exceptions are marine organisms. The class is divided into the orders Hydridae, Hydrocorallinae, Tubulariae, Campanulariae, Trachomedusae, Narcomedusae, and Siphonophora.

HYENAS (HYÆNIDÆ), a family of carnivores comprising seventeen species and races, confined to the tropical and sub-tropical areas of the Old World. Remains of the Cave-Hyena have been found in Britain.

HYÉRES (43° 7′ N., 6° 5′ E.), town, dep. Var, France, near Mediterranean, on Riviera; noted winter health-resort; trade in fruits and salt; birthplace of Massillon. Pop. 18,500.

HYGEIA, Gk. goddess of health, *d.* of Æsculapius, god of med.; bore snake in her hand.

HYGIENE, the science of the preservation of health, including all principles concerning the well-being of man physically and mentally, and in regard to his environment. See DIGESTION, FOOD, BACTERIOLOGY, VENTILATION, PUBLIC HEALTH.

HYGROMETER (Gk. *hygros*, damp); apparatus for gauging humidity of atmosphere; commonest form is 'wet and dry bulb h.,' consisting of two thermometers, one with moistened bulb. The difference between the two marks the humidity, and may amount to several degrees on a dry day, or nothing if air is saturated. Daniel's h., 1820 was bent tube containing ether, each end terminating in a bulb, one of which was covered with cloth. Evaporation took place when ether was poured upon cloth, and this resulted in cooling of cloth-covered bulb and condensation of ether inside the tube, producing moisture upon surface of other bulb. The temperature at which this condensation takes place is called the 'dew-point.'

The first h. was invented in 1676 by Coniers.

HYKSOS, SHEPHERD KINGS, an Asiatic race who conquered Egypt in XV. cent. B.C., and kept possession of country for several cent's., after which a rebellion occurred, and they are expelled; they have been identified with the Jews by some writers, including Josephus.

HYLAS (classical myth.), *s.* of Theiodamas, and beloved by Herakles; removed from earth by water-nymphs.

HYMANS, PAUL (1854), a Belgian statesman. He was *b.* in Brussels, and was educated at the University of Brussels. From 1900 he was a member of the House of Representatives from Brussels. For several years he was professor at

the University of Brussels. He was English Ambassador in 1915 and in 1917 was appointed Minister of Foreign Affairs for the Belgian goverment. He served as the first president of the League of Nations in 1920. He wrote several works on historical subjects.

HYMEN, Gk. god of marriage, *s.* of Apollo and Urania; represented with veil and torch.

HYMENOPTERA (Gk. *hymen*, marriage; *pteron*, a wing), an order with between 30,000 and 40,000 members, which include Saw-Flies, Gall-Flies, Ichneumon Flies, Bees, Wasps, Ants, etc., and includes the most highly developed of Insects. The name signifies that the upper and under wings on each side are 'wedded' or linked together in flight by a row of hooks in the latter, which catch in a hard rim of the former. H. are generally active, neat insects, with four usually transparent wings, strong mandibles, often with a 'waist,' the females furnished with a saw, sting, or boring or piercing ovipositor; and the larva undergoing a complete and abrupt metamorphosis in assuming the adult form.

HYMETTUS, modern Trello Vouni (37° 56′ N., 23° 49′ E.), mountain, Attica, Greece; famous for its honey; height, 3,370 ft.

HYMN (Gr. *hymnos*) denotes a poem written in memory of heroes, or addressed to the gods. The historic antecedents of Christian hymns are to be sought in anc. Israel, the words hymn and psalm being practically interchangeable. It is recorded of Christ and His disciples that they sang an hymn after the institution of the Lord's Supper. Hymnody developed in Eastern Christian Churches before those of the West.

In the West the introduction of hymns was due to St. Hilary of Poitiers and St. Ambrose of Milan, the latter of whom was the real founder of hymnody in the West. St. Benedict of Nursia (*d. c.* 541), by fitting of hymns to his Order of Worship, secured their widespread hold. The hymn 'The royal banners forward go' is attributed to Venantius Fortunatus (7th cent.); 'Come, Holy Ghost, our souls inspire,' to Charles the Bald (9th cent.). From the 11th to the 16th century the hymns produced were chiefly monastic in origin and character, that of St. Bernard of Cluny (12th cent.) being one of the best—'The times are very evil.'

HYOID BONE, a U-shaped bone lying immediately above the thyroid cartilage of the larnyx, and near the root of the tongue to the muscles of which it gives attachment. It consists of a more or less rectangular body (*basihyal*), and two pairs of unequal *cornua* or horns; the greater curve upwards and backwards, the smaller, about ¼-in. in length, are attached to the basihyal near its junctions with the *great cornua*. The five distinct portions in youth have cartilaginous connections, but after middle age the whole may become ossified into a single bone.

HYPATIA (370-415), *d.* of Theon; lecturer, Platonic school at Alexandria, founded by Plotinus; mathematician and philosopher; murdered by fanatics.

HYPERÆSTHESIA, over-activity of sensory nerves; symptom of diseases of brain or spinal cord or of hysteria (*q.v.*).

HYPERBATON (Gk. *huperbaton*, stepping over), term of rhetoric for alteration of order of words for sake of emphasis.

HYPERBOLA, a conic section obtained by cutting a cone with a plane perpendicular to base of cone.

HYPERBOLE (Gk. *huperballein*, to throw beyond), term of rhetoric for exaggeration.

HYPEREIDES (*c.* 390-322 B.C.), Attic orator; pupil of Isocrates; opposed Philip and Alexander of Macedon; advocated Lamian War; was captured and killed by Antipater.

HYPERION, a Titan in Gk. mythology; *s.* of Uranus and Gaea and *f.* of Helios; title-character of unfinished masterpiece of Keats.

HYPERSTHENE, mineral found in Skye and Labrador; orthorhombic, with bronze lustre or brown or green coloration; belong to pyroxene group; S.G. *c.* 3.5.

HYPERTROPHY, overgrowth of an organ or other part of the body, either through increase in the size of the components of the tissues or through increase in their nnmber, or by a combination of both. H. is due to increased exercise of a part in its functions or to increase of its blood supply; some forms of h., *e.g.* goitre, elephantiasis, are due to disease.

HYPNOTISM, a term including everything relating to the induction of a state resembling sleep, called hypnosis. Such terms as *mesmerism* and *animal magnetism* are sometimes used to describe certain aspects of it. This state differs

from sleep in an increased and extreme suggestibility of the individual, in a loss of sensitiveness of the sense organs, in a tendency to anaesthesia, and in an increased rapidity of the pulse and the respirations. Usually an individual awakened from hypnosis does not remember what has happened during the state, but the memory of this may be brought back by post-hypnotic suggestion. Somnambulism, or sleep-walking, is a state resembling hypnosis, which seems to be induced generally under the influence of mental excitement, and is hereditary in some persons.

Hypnosis is induced usually by the subject fixing his eyes on some small object in such a position that there is slight muscular strain in gazing at it, and passively allowing the hypnotizer to suggest to him the ideas of weariness of the limbs, heaviness of the eyes, and sleep. Some hypnotizers pass the hands monotonously and slowly close to or over the face. Soon the eyes close, the subject becomes drowsy, but instead of allowing him to pass into a natural sleep the hypnotizer, by speaking, etc., keeps in contact with him and thus maintains control. In this state the subject knows what is going on around him, but is only able to do what the hypnotizer allows or commands him, and he may pass into a deeper state, of hypnosis, resembling coma, in which he is more profoundly influenced than in the lighter stages. Under suggestion the subject may use limbs with much greater strength than ordinarily, while anaesthesia of a part of the body so deep that a surgical operation may be performed, may also be brought about by suggestion.

Several theories regarding hypnosis have been propounded, but the explanation which seems to give most promise of solution of the problem, upon which research is still being made, is that hypnosis is the temporary blocking of the nervous links between the different systems of neutral dispositions (the conditions of the rise of ideas to consciousness) of the brain, so that each idea works out its effects free from the interference or inhibition of antagonistic ideas, and thus is more effective than normally.

In the United States and the Continent of Europe hypnotism has been employed to a considerable extent in the treatment of disease.

See AUTO-SUGGESTION.

HYPOCAUST (Gk. *hupo*, beneath; *kauein*, to burn), Rom. chamber containing heating apparatus.

HYPOCHLOROUS ACID (HClO), strong bleaching agent formed by combinations of nitric acid (dilute) and bleaching powder.

HYPOCHONDRIASIS, nervous condition characterised by mental depression and delusions regarding the state of the health; the general health and appetite are usually quite good, but no persuasion as to the real condition is of any avail; in its most advanced form h. is a form of insanity. The treatment is general—change of air and scene, moderate exercise, and such interests as serve to turn the sufferer's mind to other matters.

HYPOSTASIS, personality (*persona*), an independent and incommunicable existence; used to mean person of the Trinity in early Christian controversies.

HYPOSTYLE (Gk. *hupo*, under; *stulos*, a column,) architectural term for Egyptian and classical buildings in which rows of columns support flat ceiling.

HYPOTENUSE (subtending), the longest side of a rightangled triangle, which lies opposite the right angle. The middle point of the H. is the centre of the triangle's circumscribed circle, and hence equidistant from the angles. The square described on the H. equals the sum of the squares on the other two sides.

HYPOTHEC (Gk. *hupotheke*, thing pledged), right given by Scot. law over effects of a debtor (Engl. lien.)

HYPOTHESIS, supposition accepted by scientific thought as a guide to further inquiry; requires verification before being held to be a demonstrated theory.

HYPOTRACHELIUM (Gk. *hupo*, under; *trachelos*, neck), name given by Rom. architect Vitruvius to moulding between the annulet of the capital and the shaft in Gk. buildings.

HYRCANIA, modern Astarabad (36° 40′ N., 54° 30′ E.), ancient district, Persia. S. of Caspian Sea.

HYRCANUS, JOHN I. (d. 105 B. C.), Jewish chief priest (135); youngest of Simon Maccabeus; forced to acknowledge suzerainty of Antiochus, but conquered Samaria and restoredJewish prosperity. His unfortunate grandson, John Hyrcanus II. (executed 30 B. C.), Jewish chief priest (78-40), was the obedient vassal of the Romans.

HYSSOP (*Hyssopus officinalis*), small perennial herb of natural order *Labitoe*, with thin quandrangular stems, elliptical leaves growing in pairs, and spikes of small violet flowers; grows in S. Europe and as far as Central Asia; an infusion of the leaves was formerly

used to relieve bruises, swellings, catarrh, etc. Hedge H. (*Gratiola officinalis*) is a herb of natural order *Scrophulariadeoe*, with cylindrical stems and solitary reddish flowers, native of S. Europe; once used as a drug with purgative, diuretic and emetic action; formerly a remedy for dropsy and gout.

HYSTASPES.—(1) ⌜legendary Persian ruler of time of Zoroaster; (2) father of Darius I.

HYSTERIA, a form of disturbance of the nervous system, characterised by exaggeration of reflex and mental excitability with diminished will-power and control over the emotions. The causes are hereditary predisposition to nervous disease, nerve exhaustion, various conditions of the genital system, and the condition often appears at such a time as puberty, pregnancy, or the climacteric. Women are affected very much more than men, most frequently girls betwen fifteen and twenty-five. The symptoms are varied, and may stimulate many different conditions, common symptoms being (1) *sensory disturbances*, hyperaesthesia or anaesthesia; (2) *motor disturbances*, epilepsy, spasms, (*e.g.* vaginismus, spasms of varins), globus hystericus (spasms of throat)), paralytis; (3) *visceral disturbances*, palpitation, vomiting; (4) *mental disturbances*, melancholia, apathy, craving for sympathy, etc. Moral influence has been found to be of greater value than drugs. Changes of air, moderate exercise, tonics, and massage are of benefit.

HYSTERON-PROTERON, Gk. name given to that figure of speech which reverses the natural order (generally for emphasis.)

HYTHE (51° 5′ N., 1° 5′ E.), ⌜market town and watering-place, Kent, England, near Eng. Channel; one of the Cinque Ports. Pop. 7,000.

I

I (Phonician and Heb. *yodh*; Gk. *iota*), ninth letter in Eng. alphabet, adopted from Lat. use of Gk. *iota*; the form was a zigzag, straightened by the Gk's; dot added to distinguish it among m's and n's in Middle Ages.

I.O.U. ('I owe you'), private document of simple nature witnessing indebtedness; of no legal value.

IAMBIC, term in prosody for verse composed of *iambi*, feet of two syllables with first short, second long. (e. g.)

IAMBLICHUS, (fl. 300 A.D.), Syrian philosopher; a pupil of Porphyry. Fragments of his works survive, but *On the Egyptian Mysteries*, often ascribed to him, is not really his. I. was a Neo-Platonist of great learning, and constructed an elaborate theological scheme. The Emperor Julian thought him as great as Plato. I. believed in an Absolute, and many other deities, arranged in groups.

IAMBLICHUS, (fl. II. cent. A.D.), Syrian Gk.; author of love-romance, *Babuloniaka*, of which only fragments are extant.

IAPETUS, (classical myth), Titan *s.* of Uranus and Gæa, and *f.* of Prometheus, Atlas, etc.; *grandfather* of Deucalion, and possibly to be identified with Hebrew Japhet.

IAPYDES, race of Illyria subjugated by Romans, II. to I. cent. B.C.

IAZYGES, Sarmatian tribe now extinct, which gave Rome trouble on the Danube, I.-IV. cent. A.D.

IBADAN, (8° 22′ N., 4° 3′ E.), town, in Yoruba, S. Nigeria, Brit. W. Africa. Pop. *c.* 150,000.

IBAGUÉ, SAN BONIFACIO DE IBAGUÉ (4° 30′ N., 75° 15′ W.), town, Colombia, S. America; commercial centre of an agricultural district, producing cacao, tobacco, sugar-cane. Pop. 25,787.

IBÁNEZ, VICENTE BLASCO. See Blasco Ibáñez.

IBARRA (0° 23′ N., 77° 53′ W.), city Ecuador, S. America; at foot of volcano of Imbabura; cotton and woolen industries. Pop. *c.* 11,000.

IBERIANS.—All is obscure concerning the origin of this ancient people; sometimes the term 'Iberian' was applied anciently to all who dwelt in Spain, but it was also given to the tribes dwelling particularly round the Ebro. Found in Spain, Southern France, Corsica, Sardinia, Sicily, and in Celtic Britain.

IBERIS, CANDYTUFT, genus of plants, order Cruciferæ; annual C. is popular garden flower.

IBERVILLE, PIERRE LE MOYNE, SIEUR D' (1661-1706), a French-Canadian naval and military commander, *b.* at Montreal. He took part in the destruction of Schenectady, 1690. In 1699 he founded Fort Biloxi (afterwards Mobile) at the mouth of the Mississippi in Biloxi Bay, and planted a French colony there.

IBEX (*Capra*), animal of Goat family; varieties: Alpine I. (*c. ibex*), Arab. I. (*c. walie*), Himalaya I. (*c. siberica*), Abyssinian I. (*c. walie*); have long, ridged horns; gregarious, but males and females form different flocks after breeding-time.

IBIS (*Ibis Æthiopica*), a bird allied to storks and spoonbills; head and neck dark and naked; plumage white, apart from glossy black dorsal feathers; beak long and curved; held sacred by ancient Egyptians, and often found in mummified condition.

IBLIS (Arab. from Gk. *diabolos*), fallen angel whose history is related in the *Koran*.

IBN' ABD RABBIHI (860-940), Arab. poet; author of valuable anthology.

IBN'ARABI (1165-1240), Muhammadan theological writer and mystic; chief work, the valuable *Alfutûhât almakkakja* (The Messan Revelations).

IBN BATUTA, ABU ABDULLAH MUHAMMAD (1304-78), Arab. traveller and writer; *b.* at Tangier; spent many years treavelling in Asia, Africa, and Europe, visiting Egypt, Palestine, Persia, Mesopotamia, Arabia, Asia Minor, Russia, India, China, and Spain;

he made pilgrimage to Mecca four times, and during visit to India was appointed kazi at Delhi; wrote an interesting account of his travels.

IBN GABIROL, AVICEBRON (XI. cent.), Jewish thinker; wrote poetic, liturgical, and philosophical works; his philosophy was influenced by Neoplatonism and sometimes thought heretical by Jews; his Arabic work trans. into Latin influenced the Schoolmen.

IBN KHALDUN (1332-1406), Arab historian; served various rulers, at Fez Tlemcen, and Tunis; app. cadi at Cairo, 1384, 1399; author of *Universal History*, a work dealing chiefly with Arabs and Berbers.

IBRAHIM PASHA (1789-1848) adopted *s.* of Muhammad Ali, viceroy of Egypt; supported Turkey in Gk. War of Independence, and was defeated by Allies at Navarino, 1827; twice invaded Syria; defeated Turks at Nezib, 1839; viceroy of Egypt, 1858.

IBSEN, HENRIK (1828-1906), Norweg. dramatist and poet; *b.* Skien; served seven years in a chemist's shop at Grimstad; wrote blank-verse plays, which were produced, and took part in stage-management, 1850 onwards, at Bergen. *The Warriors in Helgeland*, a romantic dramatic poem, was printed in 1858, but refused by managers. His first great protest against social conventions was *Love's Comedy*; its hero makes eloquent poetic diatribes (furnishing Shaw with some attractive characters), and epitomizes the moral in the last line—'A health to Amor, late of earth, in tea.' *Brand*, a beautiful lyric against moral deadness, appeared in 1866; its theme was repeated in the greater *Peer Gynt*, with its marvellous songs. From this time Ibsen's position in literature was assured. He now abandoned verse and substituted analysis and irony for lyrical attacks on middle-class vices. *The Pillars of Society*, 1877, started an exposure of the *bourgeoisie*, a constant theme of novelists and playwrights since. *A Doll's House*, 1879, *Hedda Gabler*, 1890, and other plays have largely destroyed the 19th cent. ideal of womanliness. In *An Enemy of the People*, 1882, he shows up the cowardice of public opinion. In *The Wild Duck*, 1884, Ibsen ironically ridicules the attempts of reformers. In numerous other plays he analyzed modern life and created characters which have become literary personalities. *The Master-Builder*, 1892, perhaps his chief work, has hardly yet become absorbed into common thought. Ibsen's plays have revolutionized dramatic art by their realism and their consummate mastery of stage technique.

IBYCUS (fl. VI. cent. B.C.), poet of Gk. colony of Rhegium; fragments remain; cranes discovered his murderers.

ICA, ECCA or **YCA** (14° S., 75° 52′ W.), maritime department, Peru, S. America, between Lima and Arequipa; capital, Ica; wine, fruits. Pop. *c.* 100,000.

ICE is solid water, and is precipitated as snow, frost, or hail. It consists of colorless crystals of hexagonal form, with a well-marked habit of twinning. Ice at 0° C. is less dense than water, and floats on it. Ice contracts on melting.

Iceberg is a mass of ice floating in water, retaining its equilibrium by submersion of *c.* 87 per cent. of its bulk; frequently 300 ft. high; of great danger to vessels (*e.g. Titanic*); if in quantities, icebergs affect surrounding temp. considerably. *Ice-floes* are floating fields of ice driven together by pressure of bergs.

Ice-breaker, a steamer specially constructed for forcing a passage through ice-bound waters; it may be used to clear a passage for other vessels or simply for itself. The bow is shaped to mount and crush the ice downwards, and is very strong.

ICE, ARTIFICIAL, the production of ice through various chemical or mechanical means. As an industry the artificial production of ice only became important in about 1880, but fifty years before that machines had been perfected which could produce it, though not cheaply enough to make them a commercial success. Prof. A. C. Twining, of New Haven, Conn., was one of the most prominent inventors in this line of effort, in the early fifties. Such machines require steam power to work them, and their action consists in evaporating pure ammonia in a vacuum, and again condensing the vapor to a liquid, so as to be used afresh. By such machines 20° F. below zero has been easily obtained. By the modern method pure ammonia is brought to the boiling point by the pressure of a steam pump. After it is transformed into a gas it passes into cooling pipes, where it condenses, thus producing cold artificially. These pipes pass about the tanks containing the water to be frozen. The number of methods and their variations may be judged by the fact that over 3,000 patents have been issued on ice machinery. There are about 3,000 ice plants in the United States, most of them in the South, where natural ice is not easily procurable, and in large cities in the North, such as New York, where the demand is large. The use of artificial ice is gradually spreading Northward, however, the lowering of the cost of

production rendering it a stronger competitor of natural ice.

ICE CRYSTALS. See Ice.

ICEBERG (Ger. *Berg*, mountain); a hill of ice rising often as much as 270 ft. above the sea. It is a floating mass which has broken away from some glacier or ice-sheet in the Polar regions, and which sails away from its frozen home into warmer and navigable waters. When the I. first breaks away, the fracture is green or blue, but when it comes within view of whalers and other vessels, its cliff-like faces and graceful pinnacles glisten in the sunshine with a dazzling white. During its first flight, an I. strews the sea with pebbles and rocks and other detritus—the remnant of its glacier days. As it enters warmer zones, it melts, disintegrates, tilts, and often overturns. From the specific gravity of ice, it is calculated that only one-ninth of ice mountains appears above the ocean surface and, as their speed is often considerable, it is clear that they are a grave source of peril to passing ships: it was collision with an I. which caused the wreck of the *Titanic*, 1912.

ICELAND MOSS, a lichen, *Cetraria islandica*, found in Iceland and N. Europe; edible.

ICELAND, an isl. in the N. Sea (63° 23′-66° 33′N., 13° 22′-24° 35′ W.), *c.* 500 m. N.W. of Shetland Islands and 250 m. S.E. of Greenland; N., E. and W. shores much indented by fiords; surface consists of ice-covered plateaus 1,500 to 2,000 ft., culminating in Oräfa Jökull, 6,425 ft., near S.E., coast; numerous small lakes, many being crater basins or moraine lakes. Glacier fields cover 5,000 sq. m.; in interior are large areas covered by recent lavas. Over twenty of the many volcanoes have been active in modern times; the best known are Hecla, 5,108 ft., Katla, and Askja; more than seventy earthquakes occurred in last cent.; hot springs and geysers are common. Scenery is very fine. Chief industry is breeding of cattle and sheep; principal exports: salt fish, especially cod, butter, oil, mutton, and wool; go mainly to U.K. In 1906 a telegraph cable from Shetlands by Faroes to Seydisfjord and Reykjavik (cap.) was laid; there are no railways. Only *c.* 7,000 sq. m. of area are habitable. See Map of Europe.

Iceland was discovered and colonized by Norsemen between 870 and 950, though Irish (Culdee) monks appear to have visited the isl. and partly settled there, from 795 onwards. The earliest immigrants arrived in four main streams the first and fourth from Norway, the second from the Norse kingdom of Dublin, the third from the Orkneys and Western (*i.e.* Hebridean) islands. Christianity became established *c.* 1,000. At first the Icelanders constituted themselves into a sort of aristocratic republic of franklins, whose central authority was the Althing, or national assembly, which met every summer, and was at once framer, interpreter, and executor of the laws. But internal conflicts led, 1262-71, to island falling under the supremecy of Norway. From *c.* 1280, though *de jure* only from 1388, Iceland was a dependency of the Danish crown. The restoration of national self-government was finally secured in 1918, when Iceland became a free and independent state under Christian X., King of Denmark. Area, 39,709 sq. miles. Pop. 92,000.

Language and Literature.—The language spoken and written in Iceland at the present day is almost precisely the same as that spoken and written at the date of its colonization in the 9th cent.—*i.e.*, the anc. Norræna (Northern) or Dan. tongue, which presents close affinities to A.S. The language employed in the runic monuments was also closely akin to anc. Icelandic.

Iceland possesses a rich literature which counts two periods of especial fruitfulness—(1) from about the middle of the 11th to the end of the 13th cent., and (2) from the beginning of the 19th cent. to the present time. The literature of the older period may be grouped in three divisions—the anc. mythical and heroic songs, the scaldic poetry, and the sagas. The most valuable of the mythic or mythological songs are the *Völuspa*, or 'Wise Woman's Prophecy'; *Hamarsheimt*, or 'Fetching Home the Hammer'; *Hymiskvida*, or the 'Song of Hymir'; *Vafthrudnismâl*, or the 'Sayings of Vafthrudnir'; *Grimnismâl*, or 'Sayings of Grimnir'; *Havamâl*, or 'Sayings of the High One'; and the fragmentary *Rigsmâl* —in which the doings of the gods Odin, Thor, etc., are sung. The most famous writers of scaldic poems were Egil Skallagrimsson, 904-90, whose lament for his son contain remarkably fine poetry; Eyvind, *c.* 910-95; Kormak, *c.* 937-67; Halfred the Troublesome, *c.* 968-1014; and Sighvat Thordarson, the friend of St. Olaf and Magnus, kings of Norway. But prose saga is the peculiar and crowning product of Icelandic genius. Of a mythical-heroic cast are the *Gylfaginning*, *Völsungasaga*, *Ragnar Lodbrok*, *Hrolf Kraka*, and *Orvar Odd*; while the following have a historical foundation: *Ynglinga*, *Orkneyinga*, *Færeyinga*, *Laxdœla*, *Eyrbyggja*, *Gretti*, *Egil*, *Vija-Glum*, *Kormak*, *Gisli*, *Njal* and *Gunnlaug*. The chief sources for this anc. Icelandic literature are two collections known as the

Elder Edda and the *Younger Edda*. The latter was put together by Snorri Sturluson, 1178-1241, and embraces the mythical-heroic sagas. The *Elder Edda*, which preserves the anc. mythical songs, was attributed (though upon the slenderest grounds) to Sæmund, who flourished about 1100. Ari, a contemporary of Sæmund, wrote chronicles (*Konungabok*) and a wonderful Domesday Book of Iceland (*Landnamabok*). Snorri Sturluson also compiled the chronicle known as *Heimskringla*, or 'Story of the Kings so Norway,' and as a chronicler had a worthy successor in his nephew, Sturla Thordarson, 1214-84. The relatively barren stretch between the earlier and the later literary periods can furnish the names of only three poets—Stefan Olafsson, 1620-88, Hallgrimur Petursson, 1614-74, and Eggert Olafsson, 1726-68; the eccles, historian, Finnur Jonsson, 1704-89, who wrote in Latin; and the general translator (*e.g.*, of *Paradise Lost*), Jon Thorlaksson, 1744-1819. The pioneers of the later reawakening were the last named, who also wrote original poems, Sigurdur Petursson, 1759-1827, Benedikt Gröndal, 1762-1825, and Magnus Stephensen, 1762-1833. The real awakening took place between 1830 and 1880, the most potent organ being the magazine *Fjölnir*, 1835, etc., to which poems, new both in form and in subject were contributed by Bjarni Thorarensen, 1786-1841, and Jonas Halgrimsson, 1807-45. They had a very useful ally in the philologist, Konrad Gislason, 1808-91. Sigurdur Breidfjord, 1798-1846, Steingrimur Thorsteinsson and Matthias Jochumsson have been succeeded by a younger school with more modern and realistic tendencies, represented by Pall Olafsson, Hjalmar Jonsson, 1796-1875, the younger Benedikt Gröndal, Thorsteinn Erlingsson, and Hannes Hafstein. The two most distinguished novelists of the 19th cent. were Jon Thoroddsen, 1819-68, and Gestur Palsson, 1852-91. Outside the bounds of pure literature the most distinguished names are those of Jon Sigurdsson, 1811-79, historian and political writer; the folklorist Jon Arnason, 1819-88; and Thorvaldur Thoroddsen, who has explored Iceland, and written about her geography.

ICELAND SPAR, a clear colorless variety of calcite ($CaCO_3$) found in Iceland. It forms large rhombohedra having a specific gravity of 2·7 and a hardness=3. The value of I. S. lies in its having a strong double refraction, which makes it pre-eminently suited for polariscopes, Nicol's prisms, and other optical purposes. The supply from Iceland, where crystals of very large size are found, is nearly exhausted, and no substitute has been found to compare with it.

ICE-PLANT (*Mesembryanthemum crystallinum*), creeping plant bearing white flowers; leaves have glistening appearance, whence name.

ICE-YACHTING, sport carried on principally in Scandinavia, Gulf of Finland, and N. America; a sailing-vessel is used, with runner-plank instead of keel. A speed of over 80 miles an hour can be attained with a favourable wind.

I-CHANG (30° 48′ N., 111° 32′ E.), town, treaty port, Hu-peh, China, on Yang-tze-kiang. Pop, 1911, 45,000.

ICHNEUMON, a small mammal allied to weasel, living in Egypt and N. Africa generally; feeds on snakes and on crocodile eggs.

ICHNEUMON FLIES (*Ichneumonidæ*), a family of Hymenopterous insects, with long, thin bodies, and long ovipositors. They pierce and lay their eggs in the larvæ of other insects, on which the young feed. Many agricultural pests are thus kept in check.

ICHNOGRAPHY, architectural name for ground-plan or horizontal section of a building.

ICHTHYOLOGY.—Günther, in his *Study of Fishes*, 1880, defines I. as 'the branch of zoology which treats of the internal and external structure of fishes, their mode of life, and their distribution in space and time,' and perhaps to these should now be added a study of the economic aspect of the group. See FISHES AND FISHERIES.

ICHTHYOSAURS.—Fish-like reptiles of fish-lizards which existed in immense numbers in the Mesozoic era, and of which fossil remains are found in Europe, North America, the East Indies, Australia, and South Africa. At Lyme Regis in England, and at Württemberg, in Germany, the fossils are very numerous. It is assumed that these creatures were modified from ancestors who were land animals, as they have the characteristics of reptiles. They resembled, in some respects, the modern whale. Their bodies were round and tapering, their heads large, with long snouts, and along the jaws were rows of pointed teeth, as many as four hundred having been found in one mouth. There was practically no neck. In place of limbs were broad paddles, and the creature had a vertical, fish-like tail, and a triangular fin on the back. The skin was smooth and the eyes were surrounded with wedge-shaped, sclerotic plates. The remains which have been found vary greatly in size, the smallest being about three feet in length

and the largest nearly forty feet. Thirty-five species have been identified, and some, if not all, were viviparous, as is shown by the fact that the young have been found in the abdominal cavity of some of the specimens. There is evidence to show that theichthyosaurswere predacious, and fed on fish. They are somewhat of a biological curiosity, as nothing is known regarding their origin or descent. Apparently none of them survived beyond the cretaceous period of the Mesozoic era.

ICHTHYOSIS, KERODERMA, dry and scaly condition of the skin, due to general thickening, with atrophy of sebaceous glands, occurring either congenitally or at an early stage of life. The only treatment is palliative ointments, etc.

ICONIUM, ancient city, Asia Minor, situated on plateau on slopes of Taurus Mts. Capital of Lycaonia under Romans. Walls of modern city (*Konieh* or *Konia*) built from materials taken from buildings of I. Contains famous monastery of dancing dervishes, ruins of mosques and tombs; manufacture carpets and colored leather. Pop. *c.* 45,000.

ICONOCLASTS.—A breaker or destroyer of images. In the primitive Church there was a general feeling against the use of art in Christian worship. This was owing partly to the idolatry which accompanied heathen worship. That they, like the Jews, had no images in their churches amazed their heathern neighbors. From the IV. cent. paintings and sculptures were employed in Christian worship. Only then the symbol of the cross came into use, and there was strong prejudice against a crucfix. The famous *iconoclastic* controversy arose in the Eastern Empire in the VIII. cent. The attack on images was begun by Leo III., *d.* 740; it was continued by Constantine V., but the Empress Irene restored them; another iconoclastic reaction took place, but came to an end with the Emperor Theophilus, *d.* 826. The later Church did not take up the position of the extreme I's that were themselves possessed of sacramental power, neither did it reject them altogether. In the Eastern Church *icons* like flat pictures are used, whereas the Catholic Church in the West has always believed in images, crucifixes, etc., as means of instruction.

ICONOGRAPHY (Gk. *eikon,* image; *graphein,* to describe), writing about engravings; history of Christian relics or pictures.

ICONOSTASIS (Gk. *eikon,* image; *stasis,* standing), division in Gk. churches between outer choir and inner sanctuary; adorned with *ikons, i.e.,* pictures of saints, etc.

ICTINUD, Gk. architect of temple of Apollo, of which sculptures are in Brit. Museum, of Parthenon, 433 B.C.

IDA (*d.* 559), king of Bernicia; established Anglian rule over Bernicia, 547.

IDA (Turkish *Kaz-Dagh*), a mountain range in Asia Minor, which extends through Phrygia and Mysia, and commands the ancient plain of Troy. Mount Gargarus, 5748 ft. high, its loftiest peak, was the seat of the temple erected to Cybele, the *Idœa Mater.*

IDAHO, a W. state of U.S. (45° 30′ N., 114° 8′ W.), bounded N. by Brit. Columbia and Montana, E. by Montana and Wyoming, S. by Utah and Nevada, W. by Oregon and Washington. Principal city is Boise City. Except small area in S. the surface is rugged and mountainous; the S.E. region lies in the Great Basin of U.S., while the rest, some 70,000 sq. m., lies in the drainage basin of the Columbia R.; in the N. and E., part of the Rocky Mountain system is embraced, the principal range being the Salmon R. range, separating Idaho from Montana; other ranges are the Saw Tooth and Baisé, on the Columbian Plateau; a prominent physical feature are the Snake R. Plains; the more important lakes are Pend d'Oreille, Cœur d'Alene, and Naniksu, in the Pan-Handle in the N.; and the John Day and Bear lakes in the S.E. There is abundant vegetation in the N. and center; forests extend on the W. slopes of the Bitter Root and Cœur d'Alene Mts. The climate is healthy. Mineral deposits which are owned by the state, include gold, copper, lead, silver, and coal, while in the S.E. soda, gypsum, and sulphur are found; there are many state forests; grain farming is mostly confined to river valleys, but extensive irrigation works have been carried out, the most important crop being wheat; other crops are oats, barley, potatoes, hay, etc.; the principal industries are lumber and timber working, flour and grist milling; stock raising is carried on. Admitted into Union, 1890. Legislature consists of senate, 37 members, and house of representatives, 65 members; state representated in Congress by two senators and two representatives. A large percentage of the people are Mormons. Area, 83,888 sq. m., including 534 sq. m. of water. Pop. 461,000. See Map of U. S.

IDAHO FALLS, a city of Idaho, in Bonnevilie Co., of which it is the county seat. It is surrounded by an extensive agricultural region which is well irri-

gated. It is on several important railroads. Its industries include a sugar factory. There is a Carnegie library and other public buildings. Pop, 1920, 8.064.

IDAHO, UNIVERSITY OF.—An educational institution for both sexes at Moscow, Idaho, founded in 1889, and opened in 1892. The tuition is free except in law and music. It is governed by the State Board of Education and the curricula comprises a classical course, general science, forestry, home economics, education, civil, mechanical and electrical engineering, agriculture, and law. The Agricultural Extension Division, headquarters, State House, Boise, supplies lectures, demonstration trains, movable school houses, etc. Annual income, about $260,000. President, 1922, A. H. Upham. Students, 1,420. Faculty, 100.

IDALIUM (Gk. Sugal), an ancient tn. of Cyprus, was situated almost in the centre of the island, on the site now occupied by the village Dalin or Idalion. It was sacred to the worship of Aphrodite, who was hence named Idalia. The town was destroyed by earthquake before the time of Pliny.

IDAR, EDAR (23° 50′ N., 73° E.), native states, Gujarat, Bombay, India.

IDAS (Gk. myth), *s.* of Aphareus and *bro.* of Lynceus; successfully rivalled Apollo for Marpessa's hand; slew Castor and then wounded Pollux, who had slain Lynceus, but was struck by thunderbolt of Zeus; strongest of mortals.

IDDESLEIGH, STAFFORD, HENRY NORTHCOTE, 1ST EARL OF (1818-87), Eng. politician; held various offices of state, and as Chancellor of Exchequer in Disraeli's Ministry introduced sinking fund for reduction of National Debt, 1874; Foreign Minister, 1886.

IDE, HENRY CLAY (1844-1921), American jurist and diplomat; *b.* in Barnet, Vermont, September 18, 1844; *d.* June 13, 1921; graduated from Dartmouth, 1866; State Attorney, 1876-1878; Senator, Vermont, 1882-1885; United Commissioner to Samoa, 1891; Chief Justice of Samoa, 1893-1897; member of Taft Commission, 1900; secretary of finance and justice Philippines, 1901; Vice-Governor, 1904; Governor-General, 1906; Ambassador to Spain, 1909-1913; Author *Land of the Registration Act*, 1903; *The Internal Regsitration Law of the Philippines*, 1904.

IDEA, term which has been used in a great variety of meanings: (1) In Plato, Ideas (or Forms) are universal natures, not 'in the mind but the objects of knowledge; (2) in later Platonism, they are conceptions in the mind of God; (3) in Locke, they are objects of knowledge, but tend to be regarded as representations of things in the mind; in Berkeley and Hume they are definitely subjective; (4) and (5) for the Kantian and Hegelian uses, see KANT and HEGEL; (6) in modern psychology idea generally means a process of conceiving and imaging at once, ot an object conceived and imagined at once.

IDEALISM, in a general sense, means the tendency to regard everything from an ideal or imaginative standpoint; its use in philosophy is to denote that theory of the universe according to which everything (either really or as perceived) consists of *ideas*. I. has different forms: in the absolute I. of Hegel the universe consists of ideas entirely, but ideas of the universal mind not ours; in other forms of absolute I. objects have no ultimate reality except in the minds of those who perceive them—this is more properly termed *subjective* I. In Kant's I. all human experience consists of ideas, though this does not preclude the existence of objects outside our minds. I. can fairly be said to have begun with Plato. The Platonic theory of ideas is that beyond our world of sense there is an ideal world. They stand as types from which objects in our world derive whatever reality they possess. Aristotle somewhat modifies this, and makes the individual dependent on the universal will. He showed that matter cannot really be opposed to mind, nor the particular to the universal. It was not Aristotle's I. but his formal grouping into categories which the mediæval Schoolmen followed. Of modern idealists the first was really Bp. Berkeley. In some respects he carried on the work of Locke. Berkeley held that things have no real existence apart from a mind which can perceive them, though it need not be our mind but the mind of God. Though many would refuse to follow him here, he at least was the first to show that, whatever a thing be in itself we can only know it by our own senses —a most important step in advance of that unthinking view which would make a thing just what it appears.

IDEALOGY. See PSYCHOLOGY.

IDELGRAPH, palæographical term for picture-writing, such as hieroglyphics.

IDENTIFICATION, science of the anthropometric system of identification of criminals by finger-prints was adopted, 1901, with remarkable results, and has become the recognized way of keeping record of prisoners.

IDENTITY. See PSYCHOLOGY.

IDES, 15th day of Rom. month.

IDIOCY. See INSANITY.

IDIOM (Gk. *idios*, peculiar to an individual or thing), form of a particular language or language of a particular locality.

IDIOSYNCRASY, peculiar physical or mental condition characteristic of an individual, often taking the form, for example, of an undue feeling of discomfort in the presence of certain animals, odors, etc., or of undue susceptibility to certain drugs, or of eccentricity of habits.

IDLE (53° 50′ N., 1° 45′ W.), town, W. Riding, Yorkshire, England; woolen goods. Pop. 1811, 17,999.

IDOLATRY.—Worship of idols or 'graven images' was not, as some have supposed, first stage in religious evolution, but posterior to animism. The idol worshipper fails to distinguish between his god and the idol, in whom he thinks his god dwells. 'Idolatry' in New Testament is used loosely for pagan rites.

IDOMENEUS, in Gk. legend, king of Crete who when sailing to Trojan War promised to Poseidon in return for protection the first thing he met on landing; this was his *s.*, whom he sacrificed; Crete being smitten with plague, his subjects banished him.

IDRISI, EDRISI (*c.* A.D. 1099-1154), Arab. geographer; *b.* at Ceuta, of famous Muhammadan family; studied at Cordova; travelled through Asia Minor, Egypt, Morocco, Spain, and Portugal. Pub. geographical work, 1154; constructed a globe of silver, divided it on the Ptolemaic system, and wrote explanatory book, pub. in 1592, and several times reissued and translated.

IDUMÆA, Gk. for Edom, territory of Moab; first inhabited by Horites, then by Edomites; for some time under suzerainty of kingdom of Judah, but later independent, then conquered by Assyria; Edomites were settled in S. Palestine, II. cent. B.C.

IDUN, IDUNA, Scandanavian goddess of spring and summer; seized by Loki (winter).

IDYLL, IDYL, name given by Gk's to short creative work, at first of general but afterwards of pastoral nature; *cf.* I's of Theocritus, Bion, Moschus.

IESI, OR JESI, a tn. of Italy in the prov. of Ancona, situated on the l. b. of the Esino, 17 m. S.W. of Ancona. It is noted as the birthplace of the Emperor Frederick II., and possesses a fine cathedral. Pop. 23,000.

IF, an islet of Bouches-du-Rhône dept.; off the S. coast of France, opposite Marseilles in the Gulf of Lyons. It was once covered with yews ('ifs'). Its fortress Château d'If, built by Francis I., 1529, is famous. It was used as a state prison later, Mirabeau and Philippe Égalité being imprisoned there. In Dumas' *Count of Monte Cristo* the hero is confined there.

IGLAU (49° 23′ N., 15° 35′ E.), town, Czecho-Slovakia; textiles, tobacco. Pop. 25,914.

IGLESIAS (39° 19′ N., 8° 32′ E.); town, Sardinia; bp's see; lead and zinc mines. Pop. 21,000.

IGNATIEFF, COUNT NICHOLAS PAVLOVICH, (1832-1908), Russ. diplomatist, who made treaties advantageous to his country with China, Khiva, and Bokhara.

IGNATIUS (*d. c.* 117 A.D.), one of Apostolic Fathers (*q.v.*). Though so famous, very little known of him. His epistles are preserved in three recensions, and controversy has raged over the complicated literary problem they present. I. contains seven epistles preserved in Greek, also Latin, Armenian, Syriac, and Coptic versions; II. contains these seven and six others, Gk., and Lat. version; III. (discovered by Cureton, 1845), three of first seven, preserved in Syriac. The controversy over the claims of I. and II. to be the original was mostly theological. Scholars mostly now recognize II. as original and III. as shortened from it. Ignatious defends Episcopacy and protests against Docetism and Judaising tendencies in Church.

IGNATIUS, ST. (*c.* 790-878), Patriarch of Constantinople, was the son of Michael I., Emperor of the East. He was compelled to enter a monastery, whence he rose to the patriarchate through the favor of the Empress Theodora. He was an opponent of the iconoclasts. The influence of his brother Bardas, whom he had ex-communicated led to his being forced to abdicate in 866, but he was restored in the following year.

IGNATIUS, LOYOLA. See LOYOLA.

IGNATIUS'S BEANS, seeds of *Strychnos Ignatii*, containing strychnine; found in Philippines; so named by Jesuits.

IGNEOUS ROCKS. See ROCKS: GEOLOGY.

IGNIS FATUUS (Lat., foolish fire); a luminous appearance occasionally seen

in marshy places and church-yards. It is usually visible shortly after sunset in autumn, and has been recorded in many countries. The light, which resembles a flame, is seldom pure white, and may be red, green, blue, or yellow. Accounts differ greatly, some observers speak of it as being fixed, and others as moving. Experiments have proved that it is not due to true combustion. Theories explaining its occurrence have been in turn discredited. These include the burning of marsh gas, phosphuretted hydrogen, and phosphorescent vapor. Many local names are given to the phenomenon, *e.g.* Will-o'-the-Wisp, Jack-a-lantern, etc. and its manifestations have given rise to a wealth of story and legend.

IGNITION.—This term is applied to combustions in which the fuel (material to be burned), unites with oxygen at such a rapid rate, that the reaction is accompanied by flame.

All combustible material, considered chemically, unites with oxygen at any temperature, although in most instances the reaction at ordinary temperatures is so slow that it cannot be detected without accurate scientific apparatus. Like all chemical reactions this union may be increased by the application of heat. In general their speed is doubled by a rise in temperature of 10° C. (18° F.). Eventually a point is reached at which the union proceeds so rapidly that the material bursts into flame, *i.e.*, the reaction itself generates sufficient heat to heat particles of unburned material to incandescence.

For all combustible substances there is a characteristic temperature called the 'ignition point.' If a very small portion be heated to this point, the entire mass quickly ignites, owing to the heat which is generated by the local reaction. When the speed of such ignition exceeds moderate limits, a so-called 'explosion' occurs. Waves of explosion may travel as fast as 5 miles per second.

The application of this phenomenon is very extensive. The striking of a match consists in locally heating its surface by friction to the ignition point. Similarly the match applied to paper heats a small section. The ignition point or 'flame point' of gasoline and kerosene is regulated by law, and oils which catch fire below this temperature cannot be sold. Such laws have minimized the dangers of explosion and fire in the domestic use of mineral oils. All gasoline engines are supplied with 'ignition systems,' which are a means of locally heating the explosive mixture of gasoline and air, by an electric spark, this constituting the most convenient and easily controlled method of ignition.

IGNORAMUS (Lat. pres. tense 1st person plural of verb 'to know not'), word formerly written by jury on dorse of bill of indictment which they did not find 'true'; term for stupid person.

IGNORANCE OF THE LAW does not in law excuse a man from the consequences of his acts.

IGNORANTINES, name of a religious order instituted at Rheims, 1680, now with 14,000 members from all parts of the world.

IGUALADA (41° 35′ N., 1° 34′ E.); town, Barcelona, Spain, on Noya; textiles. Pop. 10,000.

IGUANA, see LIZARDS.

IGUANODON (*Iguana*, and Gk. meaning tooth), a genus of ornithopod dinosaurs, found fossil in Jurassic and Lower Cretaceous rocks of Europe. The I. was described by Mantell in 1825, from specimens found in Kent, England. It was from 15 to 25 ft. long; the head large and narrow, and the massive body terminated in and long and very strong tail. The fore-limbs were small and adapted for grasping the leaves and branches of plants on which it fed. All the bones were hollow. The structure of the skeleton is altogehter very remarkable. It lived in great numbers in the swampy regions of England and Belgium, and other parts of Europe during the Jurassic period. Several species of the I. are known, mostly from the Wealden and Purbeck beds.

IGUVIUM, modern **GUBBIO.**—Ancient town, Umbria, Central Italy; *c.* 23 miles N.N.E. of Perusia, with Rom. remains. Famous *Eugubine Tables*, 7 in number, with religious writings in Lat. and Umbrian, were discovered, 1444, and kept in town-house. I. was famed for majolica work up to XV. cent.; an important town in pre-Rom. period; received Rom. citizenship after Social War; destroyed by Goths, 552.

IKI-SHIMA (33° 55′ N., 129° 45′ E.); small island of Japan, N.W. of Kiushiu; area, 5,858 sq. miles. Pop. C. 37,000.

ILAGAN (17° 5′ N., 121° 50′ E.); town, Luzon, Philippine Islands; tobacco region. Pop. *c.* 17,000.

ILCHESTER, ancient *Ischalis* (51° N., 2° 41′ W.), decayed town, Somersetshire, England, on Yeo.

ILDEFONSO, SAINT (607-667), a Spanish prelate and theologian, *b.* at Toledo; was a pupil of St. Isidore, became abbot of Agali, and attended the ninth council of Toledo in 653. In 658 he succeeded his uncle Eugenius as Arch-

bishop of Toledo. He added fourteen lives to St. Isidore's *De Viris illustribus*, and wrote several theological works.

ILE-DE-FRANCE, ancient province, France; enclosed between rivers Seine, Marne, Oise, Aisne, and Ourcq; correspond to departments Seine, Seine-et-Oise, Seine-et-Marne, Aisne, Oise, and a small part of Nievre and Loiret; capital, Paris.

ILETSK, ITELSKOI-GORODOK (51° 29′ N., 53° 29′ E.), town, Orenburg, Russia, near junction of Ilek and Ural; salt-works. Pop. 12,500.

ILEX, a cosmopolitan genus of plants in the order Aquifoliaceæ, which consists of between one and two hundred species. *I. aquifolium*, the common holly, is found chiefly in Central Europe; it is valued as an ornamental tree and for its fine-grained, heavy, compact timber; the berries are poisonous and have violent emetic effects. *I. Paraguayensis*, the maté plant, is val ed for its leaves, which are dried and used like common tea, under the name of Paraguay tea. The I. so frequently mentioned by classical authors is *Quercus Ilex*, the hohm-or holly-oak, a species of Fagaceæ found round the Mediterranean.

ILFORD (51° 34′ N., 0° 5′ E.), town, Essex, England; photographic material works. Pop. 80,000.

ILFRACOMBE (51° 12′ N., 4° 7′ W.), watering-place and seaport, Devonshire, England, on Bristol Channel. Pop. 10,000.

ILHAVO (40° 34′ N., 8° 38′ W.), seaport town, Aveiro, Portugal; manufactures glass, porcelain. Pop. 13,500.

ILI (45° N., 75° 30′ E.), river, Central Asia; rises in Tian-Shan mts., and flowing W., then N.W., enters Lake Balkash; length, 900 miles; navigable in lower course.

ILIAD, see HOMER.

ILIGAN BAY, on the N. coast of Mindanao, Philippine Is. The R. Iligan flows into it at the S.E. corner and here lies the town of Iligan with a large trade in rice, spices, and hemp. Pop. 6000.

ILION, a city of New York, in Herkimer co. It is on the New York Central and West Shore railroads, and on the Mohawk River and on the Erie and New York State Barge canals. It is an important industrial center and has plants for the making of fire-arms, typewriters, etc. The public buildings include a hospital and library. Pop., 1920, 10,169

ILIUM, TROY (*q.v.*).

ILKESTON (52° 58′ N., 1° 20′ W.), market town, Derbyshire, England; hosiery, lace; coal and iron mines. Pop. 7,992.

ILKLEY (53° 55′ N., 1° 50′ W.), town, health-resort, W. Riding, Yorkshire, England.

ILL (48° 30′ N., 7° 30′ E.), river, Alsace, Germany; joins Rhine 9 miles below Strasburg; length, 125 miles.

ILLAWARA (34° 30′ S., 150° 30′ E.), maritime district, New South Wales Australia; fertile; coal and iron mines. Pop. 8,500.

ILLE-ET-VILAINE (48° 10′ N., 1° 40′ W.), maritime department, N.W. France, formed from part of ancient Brittany; mostly level, with occasional marshes and numerous lakes; watered chiefly by the Ille and Vilaine; fine horses and cattle are reared; cereals, flax, hemp, apples, and pears grown; produces cider, butter, and cheese; iron mines, slate quarries; oyster fisheries; capital, Rennes. Pop. 608,098.

ILLEGITIMACY is the condition of being born out of lawful wedlock. An illegitimate child cannot inherit by right of succession—for in law he has no father—but otherwise is under no legal disabilities. Engl. law recognizes that the offspring is legitimate no matter how soon the birth takes place after marriage, but declares the offspring illegitimate when born of parents incompetent to marry, *i.e.* persons who are within the prohibited degrees of sonsanguinity or affinity. In most countries of Continental Europe special provision is made for the care of illegitimate children, and in the years following the World War nearly all these countries, and England, passed measures providing for their care and maintenance.

ILLER (48° 20′ N., 10° E.), river, Bavaria, Germany; joins Danube near Ulm; length, *c.* 100 miles.

ILLIMANI MOUNTAIN, one of the loftiest mountains of the Bolivian Andes, in the Eastern Cordillera Range, S. America.

ILLINGTON, MARGARET (1881); actress; *b.* at Bloomington, Illinois; educated at Illinois Weslayan University, and studied at Chicago Musical College; made professional debut at Criterion Theatre, New York, 1900, in 'The Pride of Jennico'; 1902-1903, played in stock company at Lyceum Theatre, New York; leading role, 1903, 'The Japanese Nightingale;' 1904, 'The Two Orphans;' 1905, 'Mrs. Leffingwell's Boots'; 1906, at London, England, 'The Lion and the Mouse'.

'His House in Order'; 1906, at Empire Theatre, New York, 'The Thief'; 1907, 1911-1912, star in 'Kindling'; 1913-1914, 'Within the Law'; 1915-16, 'The Lie'; 1916-1917, 'Our Little Wife'; 1917-1918, co-star with John Drew in 'The Gay Lord Quex.'

ILLINOIS, N. central state of U.S. (40° N., 89° 30′ W.), bounded N. by Wisconsin, E. by Lake Michigan and Indiana, S.E. and S. by the Ohio R. (which separates it from Kentucky), S.W. and W. by Mississippi R. (which separates it from Missouri and Iowa). Cap. is Springfield. Situated in the prairie-plain region, partly in the valley of the Mississippi and touching the Great Lake dist. in the N.E., the surface slopes gently to the S. and S.W.; the average height above sea-level is 600 ft., highest elevation being Charles Mound, *c.* 1,200 ft., on the boundary between Illinois and Wisconsin; bluffs are encountered along the principal rivers, the best known being Starved Rock. There are several elevations, the largest stretching across the S. from 6 to 10 m. broad, and reaching *c.* 1,050 ft. above sea-level. See Map of U.S.

There are almost 300 streams, mostly tributaries of the Mississippi, but some, tributaries of the Wabash and Ohio rivers; the most important river is the Illinois, at times broadening into vast lakes—notably the lovely Peoria Lake; several shallow lakes lie to the N.E. The soil, especially in the river valleys, is exceedingly fertile. The climate is varied the mean annual temp. being some 11° F. higher in the S. than in the N., which again varies; but summers and winters are both severe.

The chief mineral product is coal, Illinois being the third largest producer in U.S., and the coalfields extending over a vast area of *c.* 42,900 sq. m.; there are also many petroleum wells; zinc is worked, as also are lead, limestone, salt, and fluor-spar. Illinois is the richest of the U.S. in agriculture, the chief cereal crops being corn, wheat, oats, and hay; tobacco is grown, and an active live-stock industry carried on. Chief industries are slaughtering and meat packing, iron and steel foundries. Commerce is conducted by rivers, lakes, canals, and electric and other railways.

Chicago—the largest city—is second largest in America; other important cities are Peoria, East St. Louis, Quincy, Springfield, Rockford, and Joliet. There are many universities. The name of the state is derived from Illinois confederacy of Indians—the original inhabitants; explored, 1673, by a Frenchman, Joliet; passed into the hands of English, 1763, and admitted to Union as state in 1818. Legislature consists of senate, 51 members, and house of representatives, 153 members. Area, 56,665 sq. m. (622 sq. m. of water); pop. 6,317,700

ILLINOIS AND MICHIGAN CANAL. See CANAL.

ILLINOIS COLLEGE.—A co-educational institution, the oldest in the state, established in 1829 at Jacksonville, Illinois, under the auspices of a group of seven eastern college men known as the 'Yale Band.' A conservatory of music is a feature of the college, and there is a preparatory department, Whipple Academy. Endowed funds, $455,000. President, 1922, Charles W. Rammelkamp, Ph.D. Men students, 195; women, 289. Faculty, 13 men and 9 women.

ILLINOIS INDIANS.—A confederacy of Algonquin tribes, once inhabiting S. Wisconsin, N. Illinois and sections of Iowa and Missouri. Almost constant wars with the Sioux and Fox tribes, and traders' rum, reduced them in 1750 to about 2,000. In 1800 only 150 remained, the Kankakeas and Peorias, who sold their lands to Illinois and moved, first to Missouri, and now are settled in the N.E. corner of Oklahoma, and number between 200 and 300. It was their custom to practice polygamy and to wrap their dead in skins and attach them to trees. Their huts consisted of wooden frames covered with mats or rushes.

ILLINOIS RIVER.—The most important affluent of the upper Mississippi, formed by the junction of the Kankakee, Des Plaines, and Du Page rivers in Grundy Count, 45 miles S.W. of Chicago. It is 500 miles long and its whole course is within the state of Illinois, being navigable to La Salle. It joins the Mississippi about 24 miles above the mouth of the Missouri. Ottawa and Peoria are the principal cities on the river.

ILLINOIS STATE NORMAL UNIVERSITY, THE.—Founded in 1857, and located at Normal, a suburb of Bloomington. The oldest State Normal institution in the Mississippi Valley. Its purpose it to provide teachers for the state; and students are required to sign a pledge on entrance that they intend to become teachers. The tuition is free; the Board of Education of Illinois is the governing body. The University provides a four-years' course to prepare High School teachers, principals, and superintendents. There is a Normal School for teachers of elementary and rural schools; a University High School, and an elementary training school. The last two furnish training for student-teachers. There are also special courses in manual training, art, vocal music,

household economics, commerce, and agriculture. The income is about $230,000 from the State treasury, and interest from funds given by the Federal Government in 1818. Students in all departments, including summer sessions, 2,605; teachers, including the Training School, 63.

ILLINOIS, UNIVERSITY OF.—An institution for higher education, established in 1867, at Urbana, Illinois. The departments of medicine, law, and dentistry are located in Chicago. Since 1876 a Summer Session has been held. It confers on graduates the degrees B.A., and B.S. The University issues a number of publications, including 'The Law Bulletin', Medical Bulletin', University of Illinois Studies in Psychology', Studies in Language and Literature', Studies in Education'. The library contains 503,297 volumes. Income from invested funds, etc., $4,881,872; of this the State appropriates $700,000. President, David Kinley, Ph,D., LL.D. Students, 9,009; teachers, 1,065, 1922-1923

ILLINOIS WESLEYAN UNIVERITY.—A Methodist Episcopal co-educational institution, founded at Bloomington, Illinois, in 1850. It maintains a preparatory and law school, and confers the degrees B.A., B.S., and LL.B. The library contains 10,000 volumes. Value of property, about $225,000. Endowment, $350,000. Students, 591; faculty, 38, 1922

ILLUMINATI (Lat. 'enlightened'), term assumed originally by sects of Christian mystics, who claimed that their minds were illuminated by supernatural light; title assumed by Rosicrucians and modern associations of political idealists.

ILLITERACY.—Inability to read or write. The methods of collecting data on illiteracy differ widely in various countries, so that comparisons can only be approximated. In some countries inability to sign a marriage certificate, or of army recruits to read, are proofs of illiteracy, while only a few nations prepare a census. Tests made of recruits in the United States during the war period showed that there was more illiteracy in this country than had been hitherto suspected. While the 1920 census shows a gain of 1.7 per cent in literacy, it is a melancholy thought that the United States contains 5,000,000 persons over 10 years of age who can neither read nor write. In 1920, out of 82,729,315 persons over 10, the illiterates numbered 4,931,905, or 6 per cent. In 1910, it was 7.7 per cent. There were, in 1920, 1,242,572 illiterate native whites, and 1,763,740 of white foreign born. Negroes, 1,842,161, or 22.9 per cent.

Since the World War no attempt has been made to take a census of illiteracy in Europe, and the following figures apply to 1910, and a little later: Illiteracy in Austria, among persons over 11, was 13.7 per cent; Belgium, over 10, 12.7. per cent; England-Wales, marriages, 1.8; France, over 10, 14.1; German Empire, army recruits, 0.06, marriages, 4.1; Italy, 37.0 over 10, army recruits, 31.1, marriages, 38.7; Netherlands, army recruits, 0.8, marriages, 2.2; Russia, 69.0, army 61.7; Spain, over 10, 58.7; Ireland, 9.2, over 9, marriages, 8.1; Sweden, army, 0.2; Switzerland, army, 03.

ILLUMINATION, ART OF, the ornamentation of manuscript. The Celtic and Teutonic races of Europe had their own art before coming into contact with Rome, Celtic civilization being at its height in the VI. cent. B.C., and the ornamentation which they afterwards applied to MSS. was largely copied from the characteristic forms of their metalwork. Byzantine art, however, which retained the classical tradition, exercised a considerable influence on Italy, where the Eastern Empire retained possessions until XI. cent., and through Italy on Europe. The earliest examples extant of Byzantine illumination, VI. cent., are of extreme splendor, some of silver writing on purple vellum, others with gaily painted designs on gilded vellum, and gracefully drawn figures in miniature as illustrations. Initials have been called attention to by the apparently independent instinct of all schools of illuminators, but all may have been influenced in some way not now to be traced by the Byzantine tradition. The great moment of the commencement of a book was not, however, celebrated so impressively in the Byzantine as in the Western schools. The great age of Byzantine illumination was the XI. cent. The characteristic Celtic interlacing of geometric designs, dragons, etc., in medallion and leaf-shapes, appear in the elaborate borders of Celtic MSS. and in the tail of the intricate initials, and the human figure is sometimes equally elaborately conventionalised with the animal. Celtic school had more influence than the Rom. on England until the Conquest. In France, Merovingian illumination of a simple kind was replaced in 800 by the Carolingian school which culminated in the X. cent.; it was marked by splendor of pigment and some success in the drawing of the miniatures. Illumination of XII.-XV. cent's has some features of ornaments of architecture of those cent's, and the miniature initial was a characteristic feature. Eng. work was noted in XIII. and XIV. cent's but the greatest of all were the Ital. and Flemish schools of the early Renaissance.

mastery of perspective and figure-drawing appearing for the first time.

ILLUMINATION, the amount of light falling upon an object. If an object is illuminated it must be opague, *i.e.* must not absorb all the light. The eye is a very poor judge of intensity of I., but it judges equality of I. fairly accurately, and all I. experiments take account of this. I. depends on the candle-power of the source and its distance.

ILLUSION, a term loosely applied both to delusions and hallucinations, or, in other words, to pervertions of the senses and perverted ideas. Psychologists differ as to the more appropriate application of the term. Esquirol, the celebrated French alienist, 1772-1842, in classifying mental diseases, distinguished the two states by referring hallucinations to an exicted state of the brain affecting the *remembrance* of the sensations of sight and causing the subject to see what is commonly termed visions or apparitions, and defining I. as the false interpretation of a sensation actually perceived. Dr. Ferrier, while including both under the generic name of Is., differentiates between an I. of the senses and a delusion of the mind. He defines Is. generally as sensations without a corresponding external object, giving the names *spectral illusion*, phantom, or phantasm, where the eye is or seems to be the seat of sensation, and the term *vivid idea* or *conception* when the I. is due to an act of ideation. The whole distinction is sharply drawn by regarding an I. as a mockery, false show, or deceptive appearance, and an hallucination, delusion, or 'illusive transformation' (Ferrier) as a chimerical thought. Popularly, any transformed appearance of a real object, any appearance without a corresponding physical or external object, and any distorted, exaggerated, or misconceived notion or idea constitute Is. The distinction is important according to Dr. Tuke in regard to insanity, because, while the sane may easily transform a real object into something else than it is, the perception of an object externally projected without the slighest corresponding reality indicates some serious disturbance of the nervous system. Both Is. and delusions, however, are consistent with sanity. A scientist closely concentrating his mind and senses on some experimental work may well have visual and auditory Is. conjured up by a subtle interaction of some external object upon strained or expectant senses, without thereby being mentally diseased. Is. may occur quite early in life, and are more common to males than females. According to Dr. Ferrier, some who have experienced Is. have been remarkable for active memories, great ability, and extreme sensitiveness, while others were by no means so endowed; and, again, some are in perfect health, while others are suffering at the time from either trifling indispositions curable by dieting or from serious inflammatory and febrile diseases. In the criminal law, the term delusional insanity appears to embrace Is. and hallucinations indifferently, provided the reason is involved.

ILLUSTRATION. — The history of illustration commences with the Egyptian *Book of the Dead*. There remain no Gk. or Roman writings which can be dated with certainty before the Christian era, but it is known that illustration was practised by the Romans. It is found in the 3rd cent. *Iliad* of the Ambrosian Library at Milan, developed in the miniatures of Christian art (see ILLUMINATION, ART OF), and became an important feature of printed books. The earliest impressions of the printing press, where text and illustration were both engraved on wood together, are known as xylographic books. Bohner's illustrated *Fabulæ* were printed at Bamberg in 1461, Burgh's illustrated *Parvus et Magnus Catho* in England *c.* 1481. One of the earliest and greatest illustrators was Albrecht Dürer, 1471 1528. England hardly entered the field of art in any line in the 15th and 16th centuries, but took the lead in illustration in the 18th and 19th centuries. Not only in his set illustrations as for Butler's *Hudibras*, 1726, but in *Marriage a la Mode*, *The Rake's Progress*, etc., Hogarth gave interest to 'subjects of a modern kind and moral nature,' and thus stimulated illustration. Wood engraving gave place to metal for illustration in the 16th cent., but the former method was revived at the close of the 18th cent. by Thomas Berwick, whose *Quadrupeds*, 1790, and *British Birds*, 1797-1804, were mode s of illustration; the use of lithography in 1796 marked the beginning of cheap illustration.

At the same time the early 19th cent. used steel for *editions de luxe*, such as Whitaker's *History of Richmondshire*, illustrated by Turner. The most wonderful perhaps of all illustrations, Blake's *Illustrations to the Book of Job*, belong to this period. Cruikshank, Leech, and Hablot K. Browne were followed by Tenniel, Mulready, and others, and they by the Pre-Raphælites, whose works, engraved by the Dalziels in *Good Words*, etc., made 'the Sixties' a great period in illustration. *Punch* has held a unique position among periodicals for excellence of illustration since its commencement, and the *Graphic*, founded 1869, has had

work of best black-and-white artists. Modern illustration has been revolutionized by photogravure and, since 1875, by process; while color-illustration (see PRINTING) has reached a high degree of excellence. William Morris, who founded the Kelmscott Press in 1891, represents a second Pre-Raphælite movement, but the general trend of illustration is against mediævalism. A list of prominent illustrators of late times must include Abbey, Mrs. Allingham, Barnard, Beardsley, Tom Browne, Caldecott, Caton Woodville, Crane, Fildes, Frost, Furniss, Garth, Jones, Charles Dana Gibson, H. C. Christy, M. L. Blumenthal, Neysa McMein, W. A. Rogers, Grace Greenaway, Gregory, Hall, Herkomer, Holt, Phil May, Millet, Nicholson, Parsons, Partridge, Pennell, Herbert Railton, Raven Hill, Reinhardt, Renouard, Ricketts, Sambourne, Savage, Shannon, Sullivan, Hugh Thomson, Townsend, Strang, Sturge Moore, Woods.

ILLUSTRES (Lat. 'illustrious ones'), title of chief dignitaries of later Rom. empire.

ILLYRIA, wide extent of country along W. shore of Adriatic, between Fiume and Durazzo; stretches inland to Danube and Servian Morava; embraces modern provinces of Dalmatia, Bosnia, Herzegovina, and Montenegro; also S. half of Croatia-Slavonia, W. part of Servia, the sanjak of Novibazar, and extreme N. of Albania; inhabitants never clearly identified; coast colonised by Greeks, VI. and VII. cent's B.C., but some 300 years later Latin civilization spread rapidly. After long history of continued warfare, I. (excepting some mountain tribes) ultimately became entirely Serbo-Croatian, in population, language, and culture. See Map of Europe.

ILMEN (58° 15′ N., 31° 30′ E.), freshwater lake, near Novgorod, European Russia; area, *c.* 360 sq. miles.

ILMENAU (50° 41′ N., 10° 54′ E.), town, summer resort, grand-duchy Saxe-Weimar, Germany; porcelain and glass. Pop., 1910, 12,198.

ILMENITE, a mineral similar to hæmetite in appearance; opaque and slightly magnetic; generally found in gneisses and schists together with magnetite.

ILOILO (10° 50′ N., 122° 42′ E.), seaport, Panay, Philippine Islands; exports sugar, tobacco, rice. Pop. *c.* 20,000.

ILORIN, ILLORIN (8° 27′ N., 4° 30′ E.), town and province, N. Nigeria, W. Africa; important trading centre; woodcarving and leather industries. Pop. (prov.) *c.* 73,000.

ILSENBURG (51° 52′ N., 10° 40′ E.), small town, health-resort in the Harz, Saxony, Germany; iron works. Pop., 1910, 4,911.

IMAGE, term used in psychology for the impress made by an object on the eye, or for a mental impress; in theol. and art for any likeness of a person or thing; I's have played a considerable part in some religions (see ICONOCLASTS); in the Anglican Church adoration of I's is forbidden in art. XXII.

IMAGE WORSHIP.—In most great religions images have been important, not the least so in Christianity. There are different conceptions of an image: (1) it is that and nothing more; (2) it is the abode of the person or deity whom it represents, or retains a mysterious connection with him. Thus by getting possession of a man's image one could injure the man himself. This idea is called *sympathe ic magic.* Images are forbidden to Mohammadans. Eating, moving, and other acts have been ascribed to images of Christ, the Virgin, and Saints, as to those of heathern gods of antiquity (See ICONOCLASTS.).

IMAGINATION, used generally for calling up to the mind ideas other than those conveyed by senses, and, in psychology, for calling up ideas formerly received through the senses.

IMAM, the title of the caliph or leader of the Mohammadans; various sects have disputed as to nature and extent of his powers.

IMAUS, the ancient name for a part of the Himalaya Mts.

IMBECILE, weak, especially mentally weak; used of a state of mental weakness less advanced than idiocy. See INSANITY.

IMBERT, ARTHUR DE SAINT-AMAND (1834-1900), a French historian and biographer, *b.* in Paris. He was connected with the government in an official capacity, and late in life began the study of the lives of the women of the old French court of the First Empire, and the Restoration. This study resulted in a number of volumes and biographies of these women, which are considered the first authority on this subject. His studies of the women of the court of Napoleon are especially valuable.

IMBREX (from Lat. *imber,* rain), Lat. term for roof-tile curved to carry off rain.

IMBROS (40° 10′ N., 25° 40′ E.), Turkish island, in Ægean Sea; fertile; seat of Gk. bp. Pop. *c.* 8,500.

IMERITIA, IMERETIA (42° N.; 43° E.), district, forming part of Kutais, Transcaucasia, Russia.

IMITATION, copying the movements of a model, or the results of such movements. It may be (1) impulsive, *e.g.* 'contagious' coughing and yawning, or (a higher type, presupposing more attention) the rythmical movements of a spectator of dancing; (2) inventional, arising from admiration of the agent copied, or of the dexterity copied, or from desire for a remoter end to which acquirement of the dexterity is a necessary means. The tendency to imitate is in most respects similar to instinctive tendencies, and is the young child's or animal's earliest mode of acquiring the habits of the race.

IMITATION OF CHRIST, famous devotional book dating from XV. cent.; authorship much disputed; some have ascribed it to John Gerson of Paris, and others to a John Gersen who probably never lived; but these do not now find many defenders. It must be either anonymous or (much more probably) by St. Thomas A. Kempis, 1380-1471; he lived near Utrecht, and the I. certainly emanates from Holland.

IMMACULATE CONCEPTION, see MARY.

IMMANENCE, meaning 'indwelling' as opposed to 'transcendence'; so the I. of God is the view of Him as a spiritual force in the universe, not a power controlling it from without.

IMMANUEL, BEN SOLOMON (*c.* 1265-*c.* 1330), Jewish satirical poet of Italy in Dante's time.

IMMERMANN, KARL LEBERECHT (1796-1840), Ger. Romantic dramatist and novelist; *b.* Magdeburg; best works: *Merlin* (dramatic poem), *Die Epigonen* and *Münchhausen* (novels).

IMMIGRANTS, EDUCATION OF. See AMERICANIZATION.

IMMIGRATION.—All the new countries have their immigration problems, due mostly to a lack of the most desired immigrants in sufficient numbers. In the case of the United States, the problem became one peculiar to itself; it received too many immigrants, even of the type formerly most welcomed. In that respect the United States stood alone among the countries that have grown by immigration. Its policy regarding incomers, always selective, consequently became drastically restrictive. Of the old countries Great Britain alone confronted an immigration problem, due to the influx, chiefly into London, of hordes of poor Russian and Polish Jews, the most desirable of whom used the British metropolis as a half-way house en route to the United States, leaving a large residue of their unfit brethren (including criminals) behind them to aggravate London's population and economic evils. Australia and the other British dominions cannot get the immigration they want, but, like her mother country and the United States, guard against the entry of undesirables. The Latin-American republics are equally anxious to develop their resources by desirable immigration, and it is warmly encouraged.

The check on immigration to the United States had its stimulus largely in the protests of American labor against the competition of incoming European workers whose cheapness lowered the standard of living established by the higher pay the unions succeeded in obtaining from capital.

Another cause was a racial hostility to the incoming swarms of S. Europeans, Slavs and Orientals, whose settlement was views as imperilling the supremacy of Americans of Anglo-Saxon and Teutonic stock. A third cause, though less manifest on the surface, was religious, expressed in an objection to any large infusion of new population from the Catholic countries of Europe.

Immigrants flocked to America from the beginning to better themselves. Economic forces, rather than the religious or political freedom offered, peopled the United States. A mistaken stress has been laid upon Old-World tyranny as a causation for the westward movement of population. That is only true of a comparative few of the earliest settlers. the modern immigrant wandered from his homeland, as his forefathers did, in search of a more assured means of livelihood and prosperity. There are no records of the migration before 1820, when 8,385 immigrants entered. By decades immigration grew from 151,824, in 1820-1830, to 8,795,386, in 1901-1910. In the middle of the nineteenth century the influx came chiefly from Ireland and Germany. Conditions in Russia brought later a Hebrew wave. Then with the twentieth century as it advanced came the flood from Italy and Austria-Hungary, the immigration from which countries reached, in 1899-1921, well over 3,000,000 respectively.

The World War of 1914-1918 checked immigration to a level that made the annual influx a negligible factor in the country's economic life. In 1914,

1,218,480 aliens entered. The next year, with the war in full blast, the number declined to 326,700, and in 1916, to 298,826. War immigration reached its lowest point in 1918, when only 110,618 entered American ports.

Restrictive legislation did not come until 1917. The measure passed in that year was in part due to the War and the need of excluding (or deporting) an undesirable type of alien produced by the conflict. The head tax, imposed on all entering aliens was increased to $8.00. Unwanted immigrants were reclassified, and safeguards against illiteracy increased. Later, other measures were adopted by Congress aimed at protecting the country from the entry of anarchists and propagandists against the established order. It was, however, the Immigration Restriction Act of 1921, which definitely put into force the long-considered experiment of checking an increase of population from foreign sources. This measure limited the number of aliens to be admitted to 3 per cent of the number of foreign-born persons of such nationality resident in the United in 1910, according to the census of that year. There are, of course, exempt classes, and the measure was intended to be provisional. The effect of the Act was that in 1922 only 309,556 persons entered the country, as against 805,228 in 1921. The races who contributed the most immigrants in 1922, under the restriction Act were Hebrews, English, Southern Italians, Mexicans, Irish, Scandinavians, Scotch and French.

IMMORTALITY.—Belief in I. has been widespread, but not universal. It developed in Judaism comparatively late, but it has always formed a part, perhaps the chief part, of the Christian hope, and exists in many other religions. In early Christianity it was allied with the expectation of the speedy end of the world. Many arguments have been used to uphold it, and although no one of them can prove it, the sum-total possesses great cumulative force. Besides the feeling that another world is required to redress this, it can be said matter is eternal, so must spirit be too; the materialistic argument against it can be met by the assertion we do know that we are something more than our bodies. The pantheistic view that we shall be absorbed into divine life fails to satisfy those who believe there will be intensification rather than annulling of our personality.

IMMUNITY, resistance to a certain disease or to a certain organism, either natural or artificially produced by different means.

IMOLA, ancient *Forum Cornelii* (44° 2′ N., 11° 43′ E.), town, Bologna, Italy; Pop. 40,000.

IMP, formerly scion, then child; from phrase 'I. of Satan' came modern use.

IMPACT. See Energy; Physics.

IMPEACHMENT. — The accusation and trial of a person for treason, high crimes or misdemeanors. In England, the House of Commons is the prosecutor, and the House of Lords the trial court. In the United States, impeachment is by the Lower House of Congress, or by the Senate of a State Legislature. In some states the trial is held in the common courts of justice, and in others, judges of the highest appelate court sit with the senators and take part in the proceedings. Impeachment in England dates from the 15th century, and one of the most famous cases was that of Lord Bacon, in 1621, who was convicted, removed from office, and heavily fined. Since the early years of the 19th century, impeachment has become practically obsolete in Great Britain. In some of our states, under their constitution, a two-thirds vote is necessary for impeachment, and the only punishment is removal from office. In England, any punishment, even capital, is legal, but the House of Commons has the power to pardon. With us, impeachment is excepted from pardoning power. In some jurisdictions only state officers are subject to impeachment, county and municipal officers being excepted. Judicial opinions differ on the question of impeachment as to whether an official can be impeached after leaving office. In certain cases, impeached offenders can be punished by the courts for the same crime.

IMPERIAL CHAMBER (Ger. *Reichskammergericht*), from 1495 till its dissolution Court of Holy Rom. Empire; consisted of 16, then 18, judges and officials app. by empire; took place of old Imperial Court whose members were emperor's nominees. Its work was unsystematic and often taken over by the Aulic Council.

IMPERIAL CITIES in former times were cities in Germany which were directly under the emperor and owed allegiance to no intermediate lord; name became common in VIII. cent. (Ger. *Reichstadt*); cities attained their status by imperial grant or by buying their freedom from the intermediate lord; examples are Basel, Cologne, Mainz, Strassburg, Worms.

IMPERIALISM, in modern usage, signifies either extended rule over various

and often distant parts of the world or the desire to federate or unite more closely these distant dependencies with the mother country.

During the IX. cent. most European countries were engaged in more or less determined efforts to extend their colonial possessions—France, in N. Africa, and E. Asia; Germany, in Africa and the Pacific, and Italy, on the Red Sea littoral. Along with this proceeded a remarkable development of naval strength. The policy of Great Britain was profoundly affected by these events.

Imperial Federation.—The desire arose for a closer federation between the mother country and the colonies, to be promoted by such schemes as improved telegraphic and postal communication within the empire, periodical conferences in Britain at which ministers of state confer with ministers from the colonies on subjects of imperial interest, preferential tariffs, etc. In 1884 an Imperial Federation League was founded. First conference of representatives of self-governing colonies took place in 1887, when Australia undertook certain obligations in regard to naval defence. In 1893 the league was dissolved and the Imperial Federation (Defence) Committee was constituted to carry out a definite scheme based on partitipation by the colonies in the work and cost of imperial defence. In same year second colonial conference was held, direct fruit of which was offer of an ironclad by Cape Colony and the provision of coal by Natl. In 1902 advantage was taken of the presence of colonial premiers at the coronation of Edward VII. to hold a third conference, the result of which was further grants towards the defence of the empire. German naval activity in 1909 resulted in an offer by Australia and New Zealand to contribute each a battleship to the imperial navy. At a subsequent imperial conference Canada and Australia undertook to build navies of their own.

IMPEY, SIR ELIJAH (1732-1809), chief-justice of Bengal; supported Warren Hastings; impeached in 1783 for action in trial of Maharajah Nand Kumar, but acquitted.

IMPHAL, MANIPUR (24° 48′ N., 94° E.), town, capital Manipur, Assam, India. Pop. 67,000.

IMPLEMENTS AND MACHINERY, AGRICULTURAL, may be classified, according to the sequence of agricultural operations, as follows: Implements used (1) in preparing the soil for crops; (2) in sowing seeds or manures; (3) in cultivating growing crops; (4) in harvesting or securing crops; (5) in preparing crops for market; (6) in preparing crops for home consumption; (7) dairy implements and utensils; (8) implements required for estate work.

Implements used in Preparing Soil for Crops.—These include ploughs, cultivators, harrows, rollers, and land pressers, all of which have to a great extent preserved their original form, although they have been adapted to steam and oil, and probably may be to electric motor power. The plough turns the furrow completely over, and exposes a fresh surface to atmospheric action, and is therefore the most thorough of all cultivating implements. Cultivators, grubbers, or scarifiers tear and pulverize the soil by means of curved teeth, and, when worked by steam, in many cases supersede the plough. Harrows are used to render the surface fine for the reception of the seed, and to cover it; but the heavier forms do service similar to that of cultivators. Rollers are used to break clods, but still more to consolidate the seedbed after sowing, and to smooth the surface. They are plain, or toothed, or formed of segments or rings, and vary in weight from the light wooden to the heavier iron toothed and ringed rollers. Pressers are composed of two or three heavy iron wheels, placed at such a distance from each other, on a frame, as to follow two or three ploughs, and press the furrows as they are turned over. The adaptation of these implements to steam power has given rise to many forms. Thus, balance plough carries from eight to sixteen ploughs, half of which are in work, while the other half are suspended on the opposite side of the frame. At the end of the furrow the idle ploughs are lowered into work, and the working ploughs are hoisted out of work by the same movement. The powerful 7-tine cultivator is steered round the ends by the driver, and in both cases the steersman is seated on the implement. The most important of all implements, a satisfactory digger, has yet to be invented.

Implements used in Sowing Seeds or Manures.—These include various forms of drills, broad-cast sowers, seed-barrows, and manure distributors. They are all designed to supersede hand sowing, but they are neither more rapid nor cheaper than that method, although they sow the seed in rows and require less. Drills deposit the seed below the surface by means of hollow coulters; while broadcast machines and seed-barrows scatter it on the surface, or in ordinary pressed furrows, where the plants come up in rows. Drills include dry-drills, corn-drills, turnip-drills, clover-drills, bean-barrows, and potato-planters.

Implements used in Cultivating Growing Crops.—Besides hand-hoes, which are largely employed, this class includes various forms of horse-hoes. They vary from one-row scufflers for potato sultivation or root crops grown on the ridge system to multiple hoes for taking three or more drills.

Implements used in Harvesting or Securing Crops include harvesters or self-binders, reaping machines, mowing machines, loaders, stackers, swathe-turners, horse-rakes, hay-tedders, and sweeps. The self-binder delivers its sheaves, neatly tied with string, at the rate of thirty a minute, and will cut and tie up an acre of corn in an hour. There are also several kinds of mechanical potato-diggers and root-toppers in use.

Implements used in Preparing Crops for Market.—The threshing machine stands at the head of the list in this class. A good modern threshing machine separates and delivers simultaneously the straw, the cavings, the chaff, and seeds of weeds. In many modern threshing machines a chaff-cutter is attached, which delivers the cut straw into bags; or an apparatus is added which ties the straw in bundles. In others, the wheat is delivered at the proper weight into sacks ready for delivery. The finishing threshing machine combines the operation usually performed by the winnowing machine, the hummeller, and the screen. The inequalities of sample, or rather of bulk, in a large rick cause many farmers to prefer a single-blast machine, and the bulk of the corn is then turned over on a floor and rendered equal in character. It is afterwards winnowed or screened, and weighed up for market.

Implements used in Preparing Crops for Home Consumption.—These include grist-mills, kibblers, bruisers, chaff-cutters, boilers, root-splicers, pulpers and shredders, and oil-cake breakers. They are best arranged in connection with a fixed steam or oil engine, to drive a shafting with pulleys placed at intervals; each pulley carries a belt, which is passed over a corresponding pulley on each instrument.

IMPLUVIUM (Lat. from *impluere*, to rain into), receptacle in atrium of Rom. house for rain falling through *compluvium* of roof.

IMPOSITION (Lat. *imponere*, to place upon), arrangement of type after composition in printing.

IMPOST, architectural term for part of door-post on which arch rests; often forms capital of a pilaster, or is moulded; also name applied to taxes.

IMPOTENCE, inability of male to perform function of reproduction; may arise from excessive nervous strain, disease, or excess.

IMPRESSIONISM IN PAINTING.—The term 'impressionism' is said to have originated with Edouard Manet (regarded as founder of the school), who, in the preface to a catalogue of his works at the Exposition Universelle, 1867, claimed that the painter's function was to render his own 'impression' of things seen; Claude Monet's picture *The Impressionist* also served to fix the term as a general designation of certain new aims and ideals in art. These group themselves roughly under three heads: (1) the reproduction of the actual (of which Manet's work is representative); (2) the quest of the beauty and mystery of light (led by Claude Monet), hence term 'luminarists'; (3) the effort to seize some instantaneous and vivid aspect of life, and to reproduce that impression, untrammelled by detail (Degas or Renoir represents this last). Under the influence of the great Romanticist Delacroix, the two ideals of *actuality* and *light* had already been severally expressed in landscape by Courbet and Corot, Delacroix in his turn having been influenced by Turner and Constable. Impressionism has, however, no nationality; its exponents are found in every land; besides the long roll of Fr. impressionists, from Monet to the latest Fr. 'salonist,' we have the Swed. Zorn, the Norewg. Thaulow, the Dutch Maris, the Scot. Guthrie, etc.; while Whistler and Sargent stand for America. Impressionism and the later Eng. post-impressionism met with much antagonism at first; Manet's earliest impressionist pictures were exhibited in the Salon des Refusés, 1863, and at his death his fine portrait of *Claude Monet in his Studio*. Witness also the bitter Ruskin-Whistler controversy. In considering impressionism we have to take into account the extraordinary influence of modern Jap. art on the truth-seekers and light-seekers of the West.

IMPRESSMENT, the seizing and compelling men to enter navy; practice was resorted to in this country from the XIV. cent. till reign of George III., laws being passed to regulate the system; it has now died out, although these laws have not been repealed. Right to exercise power of I. is claimed by all sovereign authorities, and it has been resorted to by all European states. The impressment of sailors from American ships by English vessels of war was one of the chief causes for the War of 1812.

IMPRISONMENT, punishment by incarceration (with or without hard

labor) for offences which are not serious enough for penal servitude. I. in first division amounts to little more than confinement— prisoners may wear ordinary clothes, receive friends, etc.; in second division, special rules somewhat similar to above are in force; while criminal offenders are placed in third division (hard labor). The maximum term is generally two years.

IMPROVISATORE, poet or musician who has gift of composing without study and recites as he composes; apparently common in Middle Ages, but only appears as a freak in modern times.

INCANTATION (Lat. *cantare,* to sing), spell fashioned on the belief universal in primitive men that words placed in a certain order have magical power.

INCARNATION (from Lat. *incarnari,* to be made flesh; from *in* + *caro,* flesh), in Christian theology, the act by which the Second Person of the Blessed Trinity assumed human form and human nature. In many other religions, and especially in those of India, are there accounts of the taking of human flesh by the gods in order to secure a fuller revelation to the world, but these differ essentially from the orthodox Christian belief in the I. of Jesus Christ, which lays stress on the fact that the Logos, eternally divine, then became also essentially human, so that Christ was 'perfect God and perfect Man; one not by conversion of the Godhead into flesh, but by taking of the manhood unto God.'

INCAS, see under PERU.

IN CŒNA DOMINI (Lat. 'at the Lord's Supper'), papal bull, thus commencing, issued yearly against heretics, 1363-1770.

INCE-IN-MAKERFIELD (53° 31′ N., 2° 37′ W.), town, Lancashire, England; collieries, ironworks. Pop. 25,000.

INCENSE, a term given to various substances which when burnt give off a sweet smell—generally used in religious worship. It was used in many ancient Oriental worships, particularly in Egypt, as appears from various monuments. It was common, too, in ancient India, where its use still survives—even among Mohammadans, who elsewhere do not use it much—and in Persia and Babylonia; it is also used in Buddhist countries. The ancient Greeks burnt I. to their gods, and it was employed in Rome on festal occasions. Among the Jews the burning of I. accompanied animal sacrifices, and in the Temple its object was partly fumigatory to overcome the stench of the blood of the slaughtered beasts. In the Christian Church its use is not definitely proved before the V. cent., as the Early Fathers do not refer to it, but it was certainly used in the catacombs at Rome, though this may have been for sanitary reasons. Its use was regular in the Middle Ages, and is enjoined at certain portions of sung Mass in the Rom. Missal. It is likewise common in the Gk. and Eastern Churches, where there are liturgical formulæ for the censing of the bread and wine. In England, according to the uses of Sarum and Bangor, the altar was to be censed during Mass, but at the Reformation its use was generally abandoned. It was revived together with so many other ancient customs in the XIX. cent.

INCEST (Lat. *incestus,* unchaste), sexual intercourse between persons who could not marry on account of affinity.

INCH, 12th part of an Eng. ft.; divided formerly into 3 barleycorns and supposed to measure 3 barleycorns placed end to end.

INCHBALD, MRS. ELIZABETH (1753-1821), Eng. actress, dramatist, and novelist; beautiful and skilful player, but never overcame impediment in speech; the writings show too much cultivation of 'sentiment.'

INCHCOLM and **INCHKEITH,** islands in **FORTH SCOTLAND.**

INCIDENCE, ANGLE OF, is a term used for the angle made by the direction of a disturbance impinging on the surface of a medium with the normal to the surface.

INCLINED PLANE, a rigid plane inclined at an angle to the horizon. It is a mechanical instrument used to facilitate the lifting of heavy bodies. In the case of an incline of 1 in 6, a power of 1 lb. will support a weight of 6 lbs., thus giving a mechanical advantage of 6.

INCLINOMETER, instrument for measuring the *dip* (inclination of earth's magnetic field to horizontal). Two kinds of I's are in use—the *dipping needle* and the *earth inductor.* The former is a suitably mounted, light, magnetised needle, free to move about a horizontal axis; the latter, a coil of wire spun about a diameter, adjusted until no current is induced. The inclination of the needle, or of the diameter of the coil, to the horizontal measures the dip.

INCOME TAX.—The imposition of a tax levy on incomes is an old device for obtaining government revenue. It appeared in the Middle Ages, in Italy, and later in France. England raised money

on taxing incomes centuries before she inaugurated the modern method by establishing an income tax as a fiscal expedient in 1799 to meet the huge outlays caused by the Napoleonic wars, an impost that lasted till hostilities ceased. In 1842 she revived the tax, and it has since been in operation, an integral part of the country's fiscal system, despite Gladstone's attempt to repeal it in 1874. It has been as low as a few pennies to the pound sterling. During and after the World War it rose to a levy that expropriated one-third of annual incomes beyond $750.

By the time the United States adopted, 1913, the income tax as a stable source of revenue, the system had long been firmly established in almost every other country of importance. Not that it was wholly new to Americans. The colonies drew revenue from incomes, and quite a number of the States resorted to the same method of filling their treasuries long before the national government did. State taxation of incomes, as pursued early in the XIX. cent., was a failure. When the Civil War came only 6 States, Massachusetts, South Carolina, Pennsylvanis, Virginia, North Carolina, and Alabama, were making such a levy. In a number of other states the tax had been abandoned. During that war a number of Southern States adopted the tax in addition to those named. The Federal Government also levied an impost on incomes to meet war emergencies, the tax lasting from 1861 to 1872. In 1894 an attempt to revive the Federal Income Tax failed through the unconstitutionality of the proposed measure. State income tax meantime languished, the only levies in force by the close of the XIX. cent. being those of Massachusetts, Virginia, North Carolina, and Louisiana. The tax of the last named state soon after disappeared. With almost no exceptions, the state administration of the income tax laws was poor, the yield small, and the taxes generally unpopular.

In the XX. cent., the need of revenue compelled a number of the States to pay more and more attention to the income tax. Wisconsin led the way, in 1911, by devising a new tax system for personal and corporation incomes, and by the close of 1920 there were ten other states, Mississippi, Oklahoma, Massachusetts, Missouri, Delaware, Virginia, New York, North Dakota, and New Mexico, making similar levies by improved methods. Connecticut, Montana, and West Virginia tax the net incomes of corporations, without corresponding taxation on incomes of individuals. South Carolina stood out, in 1919, by abolishing the State income tax altogether. Ohio tried to establish an income tax in that year, but the measure was repudiated by the Legislature.

The Federal Income Tax of 1913, imposed a graduated tax of one per cent on incomes from $3,000 upward, with an additional tax of one per cent. on incomes of $20,000 upward. In 1916 (the middle of the World War period), the normal rate was doubled from one to two per cent, and the additional rate increased by scale, so that the extra tax fell heavy on very large incomes. In 1917, American entry into the war produced the War Revenue Act, which increased the income tax assessments by making the extra levy apply to all incomes above $5,000, instead of $20,000, and reduced the amounts that could be exempted. In 1919, the taxable incomes were widened to include those exceeding $1,000, the normal rate was raised to four per cent, which became eight per cent on incomes exceeding $8,000, while the surtax was applied to incomes above $8,000, beginning at one per cent, and graduating upward to 65 per cent on incomes of $1,000,000. The enormous expansion of revenue from the income tax since the United States adopted it may be judged by the yield of 1913-1914, based on the 1913 tax, which was $28,-253,534, and the amount collected in 1922 (income and profits taxes), which was $2,068,916,465.

INCREMENT, UNEARNED, denotes increase in value of land resulting, not from any expenditure of labor or money on the part of the owner, but from independent causes—*e.g.*, increase of population, municipal improvements, etc. It is maintained by some that this 'unearned' increment belongs rightly to the public, and should be appropriated by methods of taxation or rating devised to this end; principal obtains in U.S. and Brit. colonies.

INCUBATION AND INCUBATORS.—Incubation, originally the sitting of a hen on her eggs, now means the exposure of a living organism to a uniform temperature, under suitable conditions of moisture and ventilation; incubators are enclosed spaces with devices for securing this. For each organism there is a maximum, minimum, and optimum temperature. Incubation should be conducted at the optimum temperature and never reach the maximum or minimum. Incubators are employed to hatch, a practice known to the early Chinese and Egyptians. The latter employed *Mamals*, large closed brick ovens in which thousands of eggs were hatched. These were heated by low fires, which, after the twelfth day were allowed

to go out. Modern egg incubators are heated by hot air or hot water. The essential is that the incubator shall maintain a constant temperature, notwithstanding changes in temperature of the outer air, fluctuations in gas pressure, and the occasional opening of the incubator. After the tenth day the chick, having developed a fœtal respiratory organ, produces more heat, and the incubator should automatically adjust itself to this. The providing of increased air for respiration increases evaporation, and the eggs should be provided with additional moisture.

Hot-air incubators are double-walled metal cylinders, the space between the walls being packed with non-conducting material. In the centre of the floor there is a box with pipes which, after traversing the incubator, open to the exterior at the top. Inside the box there is a lamp which heats the air. The hot air then circulates through the pipes in the incubator. Fresh air is supplied to the incubator by a tube on either side of the heating box. A jar of water supplies sufficient moisture. The temperature is regulated by a valve over the main pipe from the heating chamber. Increase in temperature opens the valve, decrease closes it. The valve is worked by the expansion of a column of mercury actuating a system of levers.

Bacteriological incubators may be hot or cool; the former are kept at 37° C., the latter at 20° C. Cool incubators are used for gelatin cultures of pathogenic bacteria or to grow non-pathogenic bacteria and moulds. The temperature is maintained in summer by the passage of cold water round the walls and in winter by warm water. The hot incubators for pathogenic bacteria are square double-walled metal boxes covered with wood. Warm water is poured into the space between the metal walls and heated underneath by oil, gas, or electricity. The flame is regulated by a system of levers which can decrease or increase it when the temperature of the water makes a valve open or shut. The temperature of such an incubator remains constant for months. The air surrounding the incubator should be kept as still as possible and should be some degrees below the temperature of the incubator. A very carefully regulated and ventilated form of this incubator is used to rear prematurely born infants. When the child has grown sufficiently the temperature is gradually decreased.

INCUBUS (Lat. *incubare*, to lie upon), demon supposed to visit women and engender witches, etc.; the feminine form was the *succuba*.

INCUMBENT (Lat. *incumbere*, to lean upon; the reason for this name is not known), holder of a benefice in Anglican Church.

INCUNABULA (Lat. cradle; plural of *incunabulum*), title (nationalized in various countries) given to printed books of XV. cent.; of these there are about 30,000. Bibliographies are Beughem, *I. typographiæ*, 1688; Panzer, *Annales typographici*, 1793 and 1803; Hain, *Repertorium*, bibliographicum, 1826-38; Proctor, *Index to the Early Printed Books in the Brit. Museum*, 1898; Copinger, *Supplement to Hain's Repertorium*, 1898-1902. Many facsimiles were printed in the late XIX. cent.

INDABA, intertribal conference of Kaffirs.

INDEMNITY, a contract, express or implied, to keep a person immune from liability under a contract into which he has entered, or intends to enter. Contracts of fire, marine, and accident insurance (but not life assurance), are instances of such contracts.

INDENTURE, name for legal deed between two or more parties. Formerly the duplicates of the agreement were written on one parchment, which was then cut into two by indented line, so that the deed and counterpart could be fitted into one another and thus give evidence of being the same agreement.

INDEPENDENCE, a city of Kansas, in Montgomery co., of which it is the county seat. It is on the Atchison, Topeka and Sante Fe, and the Missouri and Pacific railroads, and on Verdigris River. It is surrounded by an extensive gas and oil field area, and its industries, which are important, include cotton mills, planing mills, flour mills, cement works, machine shops, etc. Its public buildings include hospitals, a public library and court house. It has a high school and a park system. Pop, 1920, 11,920.

INDEPENDENCE, a city of Missouri, in Jackson co., of which it is the county seat. It is on the Chicago and Alton, the Kansas City Southern, and the Missouri and Pacific railroads. It is four miles S. of the Missouri River, and 10 miles E. of Kansas City. It has several important industrial establishments. The public buildings include a high school and a public library. There are two large parks. Independence has considerable historic interest. It was occupied in 1831 by the Mormons, who remained there until 1838. It was a noted gathering place for emigrants who journeyed across the plains. Pop., 1920, 11,686.

INDEPENDENCE, DECLARATION OF. See DECLARATION OF INDEPENDENCE.

INDEPENDENCE HALL, a building in Philadelphia, where, on July 4, 1776, the Declaration of Independence was adopted by Congress and read to the people. The Continental Congress met there. It is now used as an historical museum.

INDEPENDENT CATHOLIC CHURCH IN THE UNITED STATES, THE POLISH.—A religious body formed of the Polish Catholics of Chicago, who separated from the orthodox church, by the Rev. Anthony Kozlowski. He is said to have been consecrated a bishop while attending a conference of Old Catholics in Europe. The Independent Catholics own much property in Chicago, and have built an orphanage, hospital, and academic and industrial schools, and a home for the aged.

INDEPENDENTS, name given to churches where the individual church is supreme; often called 'Congregationalist.'

INDEX, list of words about which book contains information, arranged in alphabetical order. In learned books there used to be, and still often is, an *I. personum*, *I. locorum*, and *I. rerum*.

INDEX LIBRORUM PROHIBITORUM, or simply 'The Index,' list of books which R.C. Church officially prohibits her members from having or reading. First list was issued by Pope Paul IV., in 1557; reissued from time to time, and recast by Leo XIII., 1897, when books defending heresy were prohibited, but not necessarily books by heretics not so doing; likewise immoral books must not be read. Special permission can be given to scholars and others to read prohibited works.

INDIA, the central peninsula of S. Asia (8° 4′-37° N., 61°-101° E.), includes terr. over which Brit. king as Emperor of India exercises dominion or suzerainty. (For Fr. and Port. possessions, see separate articles.) Four distinct regions are recognized: (1) the mountains north, (2) the Indo-Gangetic valley, (3) the Deccan, (4) Burma (see separate article). Area, 1,093,074 sq. m. Pop., 1921, 319,095,840. See Map of S. Asia.

(1) The Himalayas, consisting of successive folded ranges, sweep for 1,500 m. from Kashmir to Assam; mean elevation, 18,000 ft.; breadth, 200 m.; peaks, Everest, 29,002 ft., Kanchanjanga, 27,815 ft., and Dhaulagiri, 26,826 ft. Beneath them is rank vegetation of Tarai trough; the more recent Sivaliks, from Hardwar to Beas R., enclose duns (valleys) of which Dehra Dun is largest. In N.W. also is mountain frontier consisting of offshoots of Hindu-Kush through which Kabul R. and Khaibar Pass come; S. of highland of Waziristan is recent range of Sulaiman Mts. (Takht-i-Sulaiman, 11,800 ft.), crossed by Bolan Pass; farther S. Hala Mts. reach Karachi.

(2) Alluvial plains, stretching from Arabian Sea to Bay of Bengal, owe their fertility or sterility to the rivers Indus, Jumna, Ganges, and Brahmaputra. The Aravali range forms divide between Indus and Ganges systems. The Indus collects the waters of the Jhelum, Chedus and Ganges systems. The Indus collects the waters of the Jhelum, Chenab, Ravi, Beas, and Sutlej, which give the Punjab ('five rivers') its name; thence the Indus flows in ever-changing channels to Sind. The Ganges bursts through the Sivalik Hills at Hardwar, receives the Jumna ar Allahabad, and unites with the Brahmaputra to form the vast delat of 160 m. along the Bay of Bengal; the deltaic coastal belt forms the Sundarbans.

(3) The Deccan plateau (average height 1,500-2,000 ft.) is highest in W. Ghats, which extend S. to Nilgiri Hills and Cardamom Mts. separated by Polghat. In N.E. are coal basins of Gondwana system. Drainage is to E. by Godavari, 800 m., Kistna, 800 m., and Kavari, to W. by Tapti and Narbada; the E. rivers form extensive deltas.

The largest native states are Rajputana, Kashmir, Haidarabad, Baluchistan, Central India Agency, Behar, and Orissa.

Climate.—The climate varies from the cold of the perpetual snows of the Himalayas to the intense, moist heat of the plains and the dry heat of the plateau, while other differences are caused by the continental conditions of the N. and the insular conditions of the S. The S.W. (summer) and N.E. (winter) monsoons are much modified by local configuration. The three seasons are: hot (March to May), wet (June to Oct., later in S. Madras), and cool. The rainfall varies from 8 in. in Sind and Cutch to 12 in. in Rajputana; 21½ in the Punjab plains; 31 in the N. Deccan; 40-60 in Central India, W. Bengal, and Orissa; 65 in Lower Bengal; 95 in Assam and Cachar; 114 in the E. Ghats; 139 in the W. Ghats; and 152-73 in Lower Burma; while among the Assam hills it is said to reach 500 in. Owing to density of population and great evaporation, any failure of the regular rains is disastrous and leads to serious famine. The subsoil of the great Indo-Gangetic plain of the north is Recent Alluvium, that of the Himalayas

possibly at points Cambrian, with Crystalline, Upper and Lower Tertiary rocks, Volcanic and Cretaceous strata. Large districts of E. and S. peninsula have Crystalline rocks; fringing Crystalline rocks of the Deccan is a strip of Recent Alluvium along the Bay of Bengal.

Occupations. — Agriculture predominates, and has been extended by irrigation to the Punjab, Sind, etc.; the government irrigation works water *c.* 26 million ac. and the annual yield of crops is estimated to return 135 per cent on the capital outlay. The most important Ind. crops are rice, pulses, wheat and other grains; cotton, jute, and other fibres; tea, tobacco, sugar. Agricultural departments supply information to cultivators, and distribute seeds. Special attention is paid to afforestation; the state has reserved *c.* 99,000 sq. m. of forests, and controls in addition *c.* 150,000 sq. m.; Burma yields much teak. Mining is important; coal, petroleum (chiefly in Burma and Assam), manganese, gold (Mysore), monazite, wolfram, salt, and saltpetre are mined.

Industries.—The native village handicrafts suffer from the competition of factory products. Cotton is manufactured on a large scale, especially in Bombay; jute in Bengal; woolen and silk goods, paper, and timber.

Commerce.—The sea-borne trade of India is second only to that of the U.K. in the Brit. Empire. Chief exports: jute manufactures; grain, pulse, and flour; raw cotton and cotton manufactures; tea; raw jute; oil seeds and oils; leather, hides, and skins, etc. Imports: manufactured goods, sugar; chemicals, etc. Trade is mainly with U.K., Japan (which rapidly increased her share during the World War), and U.S. There is a land trade with Nepal and the Shan States.

Communications.—Most of the railways are state owned. Of the total mileage (37,029 in 1921) about half is on standard gauge (5 ft. 6 in.); nearly all the remainder is on meter gauge. Good metal roads run in all directions. The largest ports are Calcutta, Bombay, Karachi, Rangoon, and Madras.

The towns with over 200,000 inhabitants are the former cap., Calcutta (1,222,313 with the suburbs), Bombay, Madras, Hyderabad, Rangoon, Lucknow, Delhi (made the cap. in 1911), Lahore, Ahmedabad, and Benares.

History.—The earliest peoples found in India are the Dravidians, who were driven S. and into the less eligible hill districts by an Aryan invasion. This took place possibly in the second millenium B.C., possibly earlier, and is commemorated in the contemporaneous poem the *Rig-Veda*. By the VI. cent. B.C., sixteen Aryan states had been established S. of the Himalayas, and Brahmanism, apparently not known to the Dravidians, was flourishing. In the VI. cent. Buddhism and Jainism were taught. The Hindu epic the *Mahabharata* gives a legendary history of this period. Magadha (Behar) became the chief state. The invasion of Alexander the Great in 327 B.C., a famous event in European history, left a permanent mark on India, and inscriptions and art show. Alexander reached the Hydaspes (Jhelum) and retired, leaving garrisons to secure his conquests. He died, 333, before revisiting India, which, shortly afterwards, became part of the Seleucid Empire. The Indian monarch Chandragupta, 321-297, recovered a good deal of territory from the Greeks and founded the dynasty of the Mauryas, which lasted until 184 B.C.; and despite various efforts of the Seleucidæ, India broke away from Macedonian rule, the process being completed by Kadphises (*fl.* A.D. 1st cent.), founder of the great Kushan dynasty, which had its seat at Peshawar. History has not yet been disentangled from legend for these early centuries, but the invasions of the White Huns in the V. and VI. cent's B.C. stand forth. In the early days of militant Mohammedanism India successfully repelled several Arab inroads, but in 1001-24 the great Turk. leader, Mahmud, established the Ghazni dynasty in India, 1024-1186. There followed the Mongol invasion of Jenghiz Khan in 1219, and the inroad of Tartar hordes under Timour (Tamerlane of Eastern legend) in 1397, who captured Delhi in 1398. Timour established his rule in Hindustan, but the Persian sultan, Baber, who established his rule in India, 1519-26, was the true founder of the great Mogul Empire, famous until the close of the XVII. cent. Renowned rulers were Akbar, 1556-1605; his son, Ishangir, who ruled until 1627; Shah Jehan, who built the Taj Mahal as well as the fort, palace, and Jama Masjid at Delhi; and Aurungzebe, *d.* 1707, the most brilliant of the line. The last King of Delhi was deposed by the Brit. in 1858 for taking part in the Mutiny of 1857.

Trade with India was carried on by European states from beginnings of history, its mart being Alexandria. The Cape route was discovered by Vasco da Gama, 1497-98, who, in 1502, established a Port. station at Cochin. The Dutch founded their E. India Co. in 1602, the French in 1664. The Eng. E. India Co. received its first charter from Queen Elizabeth in 1600. In the next cent. and a half it continued to be merely a trading company, with stations at Surat Bombay. Madras, and Calcutta, and

ousted in turn Port. and Dutch rivals. A new era commenced in 1748, when Dupleix, the brilliant Fr. governor, interferred in disputes between rival princes for the throne. Britain followed suit, and won first great success at Arcot, in 1751 (see CLIVE). Clive was sent in 1757 to take vengeance on Surajah Dowlah, the Nabob of Bengal, for the outrage of the 'Black Hole of Calcutta,' and by his victory at Plassy laid the foundation of Brit. rule in India. The success of Sir Eyre Coote at Wandewash, in 1760, led to the extinction of Fr. rule in India. Warren Hastings, gov.-gen. under the India Act of 1773, played an important part in building the Brit. Empire. He subdued the Mahratta princes, and collected the army with which Sir Eyre Coote crushed Haidar Ali, Sultan of Mysore, at Porto Novo, 1781. Marquis Wellesley, gov.-gen. 1798-1805, induced the Nizam of the Deccan and other native princes to accept Brit. protection, stormed Seringapatam, cap. of Haidar Ali's successor, Tippoo, and subdued the Maharattas, his brother Arthur, future Duke of Wellington, winning the hard-fought battle of Assaye, 1803. Lord Hastings, gov.-gen. 1813, reduced Nepal to submission without depriving it of independence.

Britain was now practically supreme over peninsula S. of a line from the mouth of the Indus to that of the Ganges, and over the basin of the Ganges itself. Between 1848 and 1856 the Marquis of Dalhousie annexed more territory than any other gov.-gen. before or since. By the defeat of the Sikhs at Gujarat and elsewhere the Punjab was brought under Brit. rule. S. Burma, including the port of Rangoon, was annexed, and, most important of Dalhousie's achievements, Oudh, 'the garden of India.' His high-handed proceedings in Oudh had much to do with the Indian Mutiny. The Mutiny broke out in 1857 at Meerut; the chief centers of the war were Delhi, Cawnpore, and Lucknow. Cawnpore was the scene of the 'Bloody Well'; Lucknow is celebrated for the relief brought to the Brit. garrison by General Havelock. With the capture of Delhi, the headquarters of the rebel troops, the back of the rebellion was broken. The Derby-Disraeli ministry then transferred the government from the E. India Co. to the crown, 1858. The company was dissolved in 1874. The last flames of the Mutiny, kept alight by Nana Sahib, were quenched by Lord Canning, 1859-62; but the unrest in many parts, especially Bengal, has been a serious danger ever since. There were terrible famines in 1861, 1866, 1868-9, 1874, 1876-7, 1897-7, and 1899. Sir John (afterwards Lord) Lawrence, who became viceroy in 1864, had to meet Hindu discontent and famine in Orissa. After some losses of Brit. forces, he made an agreement with the Bhutanese, 1865. The Earl of Mayo became viceroy in 1869, and was faced with serious deficiency of the revenue, and wide dislike of the new income tax (abolished 1873). After his assassination by a convict in 1872, Lord Ellenborough succeeded, and was followed by Lord Northbrook in 1872, and by Lord Lytton, 1876-80.

In 1876 Queen Victoria was proclaimed Empress of India in London, and the next year at Delhi. Invasions of N.W. tribes culminated, 1878-80, in the Afghan War, by which Britain obtained possession of the mountain passes. Lord Ripon, viceroy, 1880-4, by various democratic measures, including his scheme of local self-government, which developed municipal institutions, and by the attempt to extend the jurisdiction of the criminal courts in the districts over European British subjects, independently of the race or nationality of the judge, won much unpopularity. This attempt ended in the compromise of 1884. He enjoyed, however, unusual native good will. Lord Dufferin, 1884-8, introduced various reforms, annexed Upper Burma, 1886, and passed an Income Tax Bill, 1886. Lord Lansdowne, 1888-94, and Lord Elgin, 1894-99, restored the finances, the former introducing gold standard.

In Lord Elgin's time there were a number of risings along the N.W. frontier. In 1895 the Brit. agent in Chitral was beseiged, and had to be rescued by an expeditionary force. Two years later the Wazirs, Swalis, and Mohmands attacked the Brit. positions in Malakand, and the Afridis closed the Khaibar Pass. Peace was only established after a prolonged campaign (the Tirah campaign). During the 1896-7 famine bubomic plague made its appearance, and the measures taken to prevent the spread of the disease caused rioting in Bombay and elsewhere. Lord Curzon, 1889-1905, reorganized the N.W. Provinces, naming them the United Provinces. In 1904 the pro-Russian attitude of the Dalai Lama of Tibet necessitated an expedition to Lhasa. The Dalai Lama abdicated, and a treaty was concluded with his successor. In 1905 Bengal was divided into the provinces of E. Bengal and Assam. The great Punjab earthquake took place the same year. Lord Curzon continued the development of India on Western lines, but eased the burden of taxation. He resigned after a serious dispute with Lord Kitchener, commander-in-chief, as to the respective authorities of the latter and the military member of the governor's council in time of war. The matter was decided in 1906 to the satisfaction of Lord Kitchener and

the new viceroy, Lord Minto, 1905-10.

Plague had been raging in the Punjab since 1897, and in 1907 there was an alarming increase of sedition there and in Bengal. Severe measures of repression were taken against both Mohammedans and Hindus. Lord Morley now brought forward measures for giving natives a certain amount of representation, and native satisfaction was expressed for the India Council's Act, 1909. Lord Hardinge succeeded as viceroy in 1910. George V. visited India in 1911-12, was proclaimed emperor at Delhi Durbar and declared Delhi cap. in place of Calcutta. An attempt was made on the viceroy's life during the state entry into Delhi. The development of communications, the growing use of the Eng. language, and Eng. education, which has evolved a certain common outlook amongst the increasing products of the universities, have brought about a great increase in material prosperity, but have also profoundly affected Indian thought. World movements acting on the dawning sense of nationality in India have effected an intellectual revolution. They have produced certain malignant forces, such as the outbreak of anarchism, but also certain healthy forces such as the desire for progress and larger powers of self-government. The years 1914 and 1915 were comparatively peaceful. In the latter year, however, the Lahore Conspiracy Case revealed a plot for upsetting the government, probably instigated by Germany. In the spring of 1916 Lord Hardinge was succeeded by Lord Chelmsford. During the year the foundation stone of the Hindu university at Benares was laid. In 1917 the political truce which had been observed since the war commenced was broken. In Madras in particular, Mrs. Annie Besant entered upon a campaign of active criticism against the government, with the result that her liberties and those of her two most active supporters were restricted. The excitement thus caused was allayed by the official announcement that the goal of the imperial government in India was the attainment of full self-government within the empire, and that while Parliament would be the judge of the time and place of the steps to this end, substantial measures would be taken without delay. Mr. Montagu, secretary of state for India, visited the country during the year, and in Nov., 1918, Parliament duly endorsed his proposals.

The outstanding historical incident since that time has been the series of disturbances in the Bombay Presidency, in Delhi, and in the Punjab in April, 1919. The most serious outbreaks occurred at Amritsar, where rioting and the murder of a number of Europeans took place. On the afternoon of April 13, Brigadier-general Dyer, with a small force, opened fire upon a dense crowd in a confined space, with the result that 379 persons were killed and probably three times as many wounded. A commission, with Lord Hunter at the head, was appointed in October, 1919, to investigate, and its report was published as a parl. paper on May 27, 1920. The majority report held that the outbreaks were acts of rebellion, as distinguished from mere riot and political opposition, partly due to resentment against the Rowlatt bills and to the Satya-Graha or civil disobedience movement started by Mr. Ghandi. They also held that the authorities were justified in declaring martial law, but that the action of General Dyer in starting firing without giving the assembled people time to disperse, and the continuance of the firing after the crowd had begun to disperse, was due to a mistaken conception of duty. The government of India endorsed this view, and also held that the administration of martial law in the Punjab was marred in certain instances by the misuse of power and injudicious and irresponsible acts largely due to the inexperience of the officers, combined with an absence of executive instructions for dealing with a situation so abnormal. Subsequently, upon the appeal of General Dyer, the War Council inquired into his case, generally concurring in the findings of the Hunter Commission. After an animated debate the House of Commons adopted the same view by a majority of 100, July 8, 1920.

The most important vernaculars (of which there are 147) of India are the Aryan (spoken by over 200,000,000 natives) and the Dravidian (spoken by 56,000,000), probably the indigenous speech. The former are the speeches of nearly all the tribes of N. India, the latter belong to the S. and the hill tribes of the center. The chief races are the Turko-Iranian of the N. (including the Afghans, Baluchi, and Brahui of Baluchistan and the N.W. Frontier Prov.), the Indo-Aryan of the Punjab, Rajputana, and Kashmir (represented by the Rajputs, Khatris, and Jats), the Scytho-Dravidian of the W. (represented by the Mahrattas and possibly by the Kunbis and Coorgs), the Aryo-Dravidian of Behar, the United Provinces, and parts of Rajputana (including Hindi), the Mongolo-Dravidian of Bengal and Orissa, the Mongoloid of the N. frontier, and the Dravidian of the Indo-Gangetic plain and the Central Provinces. The caste system of India is an extreme example of the differences in social rank always produced by foreign conquests; the tribes who conquered the original Dravidians

must, however, have largely adopted their speech. According to the census there are in India 217,587,000 Hindus, 3,014,000 Sikhs, 1,248,000 Jains, 10,721,000 Buddhists, 100,100 Parsis, 10,295,000 Animists, 66,623,000 Mohammedans, 20,980 Jews. Christians, in 1911, numbered 3,858,000, Roman Catholics being 1,490,800. Some 18,539,400 are able to read and write, and 1,700,000 have a knowledge of English. The five universities of Calcutta, Allahabad, Bombay, Madras, and Punjab have recently been augmented by the new Hindu univ. at Benares, and universities at Patna and in Mysore State. In 1917 there were for males, 7,004 secondary and 124,081 elementary schools, in addition to 179 colleges, 35,848 private institutions, and 4,323 special schools. For females, there were 689 secondary and 18,122 primary schools, in addition to 16 colleges, 1,955 private institutions, and 538 special schools. The total number of individuals under instruction was: males, 6,621,527; females, 1,230,419. There remains an enormous proportion of illiteracy. Newspapers are pub. in twenty-two dialects.

Government of India.—In 1858, an Act was passed transferring the government of India from the E. India Co. to the crown. This Act made no important change in the administration of India, but the gov-gen. became known as the viceroy. He is the sole representative of the crown in India, and is assisted by a council composed of high officials, each of whom is responsible for a special part of the administration. The distribution of functions between the government of India and the provincial administrations or states fluctuates; broadly speaking, it may be said that the tendency of the day is to confine the government of India to control, and the local governments to administration. The government of India retains in its own hands all matters relating to foreign relations, defence, general taxation, currency, debt, tariffs, post, telegraphs, and railways. The ordinary internal administration—the assessment and collection of revenue, education, medical and sanitary arrangements, and irrigation, buildings, and roads—falls within the purview of the local government. In all these matters the government of India exercises a general and constant control. It prescribes lines of general policy, and tests their application from the annual administration reports of the local authorities. It directly administers certain imperial departments, such as railways, post office, telegraphs, the survey of India, and geology. There is a wide field of appeal to the government from officials or private individuals who feel aggrieved by the action of local governments. The supervision of the principal native states rests directly with the gov.-gen. in council, but local governments have also certain responsibilities.

To bring the administration into close touch with public opinion, the executive council was expanded in 1861, by additional members into a great legislative council, and the representative system was introduced in 1892. Further reforms were introduced in 1909, and the 1919 Act established an Indian legislature consisting of the viceroy and two chambers, the council of state, consisting of 60 members, of whom not more than 20 are officials, and the legislative assembly, containing 140 members, of whom 26 are official members. These chambers may sit jointly for the adjustment of differences. The term of office of the council of state is five years, and that of the legislative assembly three years, but dissolution may take place earlier, or the term may be extended by the viceroy, who has also the power, with the assent of the Brit. Parliament, of enacting certain measures against the wish of the council or assembly.

Provincial Governments.—British India is divided into eight large provinces and six lesser charges, each of which is termed a local government. The eight major provinces are the presidencies of Madras, Bombay, and Bengal; the lieut.-governorships of the United Provinces, the Punjab, Burma, and Behar; and the chief commissionerships of the Central Provinces. The minor provinces are Assam, the N.W. Frontier Province, Baluchistan, Coorg, Ajmere Merwara, and the Andaman Islands. The three presidencies occupy a superior position. The civil administration of each is vested in a governor-in-council appointed by the crown and assisted by a council of three members (two members of the civil service) and, under the Indian Councils Act of 1909, of a fourth who is usually an Indian. Lieut.-governors are appointed by the gov.-gen., and must have served for at least ten years in India. Chief commissioners are in theory delegates of the gov.-gen., but in practice have powers little short of lieut.-governors. The Act of 1909 more than doubled the number of members of the *provincial councils*. Election by specially constituted electorates was introducee, and power was given to members to debate and move resolutions on the provincial financial statements and on questions of general public interest, also to ask supplementary questions. The rules for discussion of the annual financial statement are similar to those applicable to the supreme council.

Local Administration.—The adminis-

trative system is based on repeated subdivision of territory, each administrative area being in the responsible charge of a member of the civil service who is subordinate to the officer next in rank above him. The most important of these units is the district, and India is divided into 250 districts, with an average area of 4,430 sq. m., and an average pop. of 931,000. The head of a district is styled the collector and district magistrate or the deputy commissioner. He is the representative of the government, and embodies the power of the state. He is concerned in the first place with the land and land revenue, and has magisterial powers. He also guides and controls the working of municipal government.

Local control over certain branches of the administration is secured by the constitution of local boards and municipalities, the former exercising authority over a dist. or taluka, and the latter over a city or town. These bodies are composed of members either nominated by government or elected by the people, who are empowered to expend funds derived from levies on the land revenue, tolls and ferries, on education, sanitation, the construction of roads and tanks, and general improvements. The tendency of recent years has been to increase the elective and reduce the nominated element.

India and World War.—The declaration of war was followed in India by unprecedented demonstrations of loyalty on all sides, and the numerous offers of help or personal service made by the chiefs and people aroused in Britain a feeling of intense gratitude. India was not included in the actual theatre of war, except when Madras was subjected to a slight bombardment by the Ger. cruiser *Emden*, but up to Dec., 1914, shipping in the Bay of Bengal and in the Arabian Sea was on several occasions interfered with, and a number of vessels were sunk by enemy ships. Legislation was adopted prohibiting the activity of hostile trading firms, but a general exemption was issued in favor of companies which had no hostile foreigners as officers or merely had capital of amount less than one-third in enemy hands.

An exemption was also made on political grounds in favor of Asiatic subjects of Turkey. An Enemy Trading Ordinance was promulgated in June, 1916, similar in character to the Brit. Trading with the Enemy Act, but was very sparingly exercised. Internment was practised in the case of less than 500 persons. The control and marketing of Ind. wheat was taken over by the government, and was successful in reducing Ind. prices to a safe level and placing at the disposal of the population of the U.K. the Ind. surplus. The finance member, in introducing the Budget of 1915-16, said that besides providing the Ind. armies which were fighting abroad, India has rendered invaluable aid by recruiting and training large numbers of soldiers; by furnishing supplies of all sorts of foodstuffs, clothing, ordnance, equipment, and munitions; by training and dispatching horses; by lending to the Admiralty a great part of her Royal Indian Marine Fleet; and by fitting out transports. The total value of the supplies and services of all sorts which she has thus undertaken on behalf of the War Office amounted to about $50,000,000, in 1914-15, and is estimated at about $90,000,000, in 1915-16, and to $110,000,000, in 1916-17. The assistance given by the Ind. princes in special gifts towards the cost of the war now totals about $5,000,000. Further, considerable sums have been placed at the disposal of the commander-in-chief to be spent in the purchase of horses, motor cars, motor ambulances, etc.' A special loan was raised in 1917-18 which produced approximately forty millions sterling; the legislative council accepted one hundred millions sterling of the Imperial War Dept., and provided the taxation necessary to discharge interest and sinking fund charges, amounting to six millions a year.

Originally the Mesopotamian campaign was undertaken by the Ind. Government. The disaster at Kut and the breakdown of the medical arrangements led to the Mesopotamian Commission which condemned the advance to Bagdad under the existing conditions, and censured the viceroy, the Ind. commander-in-chief, the military secretary of the Ind. Office, the secretary of state for India, and the war committee of the cabinet.

Ind. soldiers played a very large and distinguished part in the conquest of Palestine, especially in the later stages, when most of Allenby's troops consisted of Indians. See PALESTINE.

INDIA, FRENCH.—The Fr. possessions in India comprise Pondicherry, Chandernagore, Karikal, Mahé, and Yanaon; administered by the governor of Pondicherry. See Map of S. Asia.

INDIA, PORTUGUESE.—The Port. possessions in India comprise Diu, Damão, and Goa. Area, 1,638 sq. m. Pop 605,000. See Map of S. Asia.

INDIA RUBBER. See RUBBER.

INDIAN CORN. See CORN, INDIAN.

INDIAN INK. See INK.

INDIAN MUTINY, rebellion of native army of Bengal, 1857. The immediate

cause of outbreak is supposed to have been the introduction into the army of cartridges, greased with cows' and pigs' fat, the handling of which was abhorrent both to Hindus and Muhammedans; but discontent with British rule had long been gaining ground. After several slight outbreaks early in the year the mutiny began in earnest, with the revolt of the native regiments at Meerut, in May, 1857, when the Sepoys murdered the Eng. officers and massacred European residents; the mutineers then marched towards Delhi, which they captured and retained for four months.

In July occurred the terrible massacre of English at Cawnpore by the Nana, whom Havelock defeated on the following day; on Sept. 14, Delhi was at last stormed and taken by English; and Lucknow, which at first was defended by Sir Henry Lawrence, was partially relieved by Havelock in Sept., 1857, and in Nov. by Sir Colin Campbell (afterwards Lord Clyde), who finally captured it in July, 1858.

Others who distinguished themselves during the mutiny were Lord Canning, Gov.-Gen., who conducted affairs in Calcutta; Sir John Lawrence, who enlisted support of Sikhs and contributed greatly to Brit. success by sending large contingent to Delhi; General Outram, who served under Havelock; General Nicholson, killed in storming of Delhi; and Sir Hugh Rose, who conducted campaign in Central India, and by his capture of Jhansi and other positions practically ended the war. On re-establishment of Brit. authority, a royal proclamation announced that the governing power of the East India Company was abolished, and that henceforth the sovereign of England would be supreme ruler of India.

INDIAN OCEAN (*c.* 4° N., 75° E.), bounded W. by Africa, N. by Asia, E. by Australia and Malay Archikpelago; divided in N. by Ind. Peninsula into Bay of Bangal (E.) and Arabian Sea (W.); mean depth, *c.* 2,300 fathoms; area, *c.* 17,320,300 sq. miles; receives many important rivers from Asiatic continent; chief islands are Madagascar, Mauritius, Réunion, and Comoro Islands.

INDIAN RESERVATIONS, territory set aside for the exclusive use of Indians by the United States Government. This practice was begun even in colonial days, by Massachusetts, Connecticut, and Rhode Island, the terms of the treaties usually being that in exchange for the greater part of their hunting lands the Indians would be left unmolested in more restricted territory, and receive annual allowances in the form of clothing, provisions and other means of livelihood, to take the place of their loss of hunting grounds. After the Revolution, this policy was pursued by the Federal Government, notably in the allocation of Indian Territory to the five 'civilized tribes,' the Cherokees, Seminoles, Creeks, Choctaws, and Chickasaws. Many evils followed in the wake of this policy; the Indians were demoralized by Government support, and there was constant aggression on the part of white settlers to obtain land in the reservations with the most fertile soil, the Government often being obliged to send out troops to drive out squatters. The Dawes Act, passed by Congress, in 1887, marked a change in this policy, by providing for individual ownership of land by the Indians, together with a program of popular education and assistance in agricultural enterprise. This course has been slowly pursued with success, and at the present time the area of Indian reservations has been considerably reduced. In 1923 there were about 180 reservations in the United States, covering the states of Oklahoma, Arizona, South and North Dakota, New Mexico, California, Montana, Washington, Wisconsin, North Carolina, Nevada, Oregon, and New York.

INDIAN TERRITORY, an area of about 30,000 sq. miles, which had been set apart as an Indian reservation, in 1834, with Kansas on the N., Missouri and Arkansas on the E., and Texas on the S. and W. After the Civil War, when the West was being settled, strong pressure was brought to bear on the Government to open this section up to settlement, and finally, in 1889, it was decided to purchase that part known as Oklahoma from the indians and declare it open for settlement. The rest of the territory remained closed, but in 1894, Congress authorized a survey, the country being until then almost unknown. It was inhabited by what were known as 'the five civilized tribes,' the Cherokees, Chickasaws, Choctaws, Creeks, and Seminoles, numbering 101,506, in 1922. Unlike the surrounding prairie states, this country was found to be largely mountainous, and two-thirds covered by heavy forest. In 1907, this territory and Oklahoma were joined together, and as a whole admitted into the Union as the forty-sixth state. The discovery of oil has done much to develop the state since then, the output of this commodity in 1920 being valued at over $401,000,000, many of the enriched land owners being Indians.

INDIANA, N. central state of U.S. (39° 46′ N., 86° 20′ W.), lying between Lake Michigan and the Ohio R.—which constitutes S. boundary line — and

bounded N. by lake and state of Michigan, E. by Ohio, S. and S.E. by Kentucky, and W. by Illinois. The cap. is Indianapolis. The surface is mostly undulating prairie, with a gentle S. slope, and having a range of sand-hills in the N.; S. of this the country is flat and marshy with shallow lakes; and along the Ohio R., in S., a chain of hills ('Knobs') rises steeply.

The most important river is the Wabash, a trib. of the Ohio, and measuring over 500 m., of which *c.* 350 are navigable; it is the boundary between Indiana and Illinois; other rivers are the Kankakee (trib. of the Illinois), and the St. Joseph and Elkhart into Lake Michigan, the Maumee into Lake Erie, and White Water into the Ohio. English Lake (part of the Kankakee) is the only large lake. See Map of U. S.

The climate is equable; the soil—excepting sandy region S. of Lake Michigan—is exceedingly fertile, especially the Wabash valley. The state coalfields have an area of about 6,500 sq. m.; petroleum, natural gas, sandstone, limestone, and cement are worked. The land is largely agricultural—the chief crops being corn, wheat, oats, hay, and potatoes; tobacco is also grown, as well as fruits and vegetables of all varieties. Manufactures and industries are important, and include clay working, flour, and grist milling, slaughtering and meat packing, iron and steel foundries, as well as woolen works and manufacturing of agricultural implements. Indianapolis is an important center for live stock. Natural facilities for transport are provided by the Ohio and Wabash rivers and Lake Michigan; there are extensive railways. Admitted to the Union as state in 1816. Legislature consists of senate (50 members) and house of representatives (100 members); two senators and 13 representatives go to Congress. Area, 36,354 sq. m. (including 309 sq. m. of water). Pop. 2,930,390.

INDIANA, a borough of Pennsylvania, in Indiana co. It is an important industrial community, and has glass works, tanneries, and flour mills. It has also important coal mining interests. It is the seat of a State Normal School. Pop., 1920, 7,043.

INDIANA, UNIVERSITY OF.—Founded in 1820, it was opened in 1824 as the Indiana Seminary, and adopted the name of college in 1827, and university in 1838. Since 1867 it has been co-educational. The tuition is free, a board of trustees making reports biennially. The courses include, languages, science, and history; the degrees, Ph.D., and A.M., being conferred for graduate work. Law and medical schools are attached, and a biological station is maintained at Winona Lake. President, 1922, W. L. Bryan. Students, 3,914; faculty, 211.

INDIANAPOLIS, a city of Indiana, the capital of the State, and the county seat of Marion co. It is the largest and most important city of Indiana, and in the geographical center of manufactures in the U.S. It is on 16 railroads, and on the White River. The city has an area of 42 sq. miles. It is situated on both sides of the river, but chiefly on the E. bank. The two parts of the city are connected by several bridges. Indianapolis, on account of its situation, is preeminently an industrial city. It has exceptional shipping facilities and is near ample fuel supplies. There are approximately 1,000 manufacturing establishments, and nearly 2,500 retail concerns, In addition to these, there are over 200 wholesale and jobbing houses which carry on extensive business with all parts of the Central West. One of the most important industries is slaughtering and meat packing. Over 3,000,000 head of livestock are received annually by the stock yards. Other industries of importance are the making of milling machinery, engines, drugs, automobiles, furniture, and starch. The city is well laid out and has nearly 400 miles of improved streets. There are over 400 miles of sewers and nearly 450 miles of water mains. The city is maintained on a high standard of government. It is the seat of many important State institutions, including the State Institute for the Blind, a school for the deaf, Indiana Girls' School, Indiana Women's Prison, and Central Hospital for the Insane. It is also the seat of the School of Medicine of Indiana University, and of the Indiana University Extension Center. It has one of the finest libraries in the U.S., which was erected at a cost of nearly $10,000,000, and contains nearly 225,000 volumes. There is also an excellent State Library in the State House. The school system has a high order of merit. There are about 75 public school buildings, over 30 of which are equipped with manual training and domestic science courses. In addition to these there are about 20 Catholic parochial schools, two academies for young women, and three Catholic institutions for boys. Other educational institutions are Butler College, Indiana Central University, College of Music and Fine Arts, and many private schools for boys and girls. The city has several excellent hospitals and many handsome office buildings, theatres and apartment houses. Indianapolis was settled in 1819, and was given its present name in 1821. It became the capital of the State

in 1825. With the introduction of natural gas as fuel, in 1889, its growth has been remarkably rapid. Pop., 1920, 314,194.

INDIANS, AMERICAN, OR RED, were called Indians by British as being inhabitants of what the early discoverers of America believed to be the W. Indies, but are known to most nations as Redskins (*e.g.*, Fr. *Peaux-rouges*). They are confined to the Amer. continent, and now generally believed to be a Mongolian people separated from Asia by the comparatively recent subsidence of the 'Pacific continent.' In the convenient approximation to racial division of the classification Black, Brown (or Red), Yellow, and White, they constitute the Brown group (see RACES OF MANKIND). The Palæolithic remains show early habitation. The numerous tribes may be divided into these main stocks: (1) N. America: Algonquin, Athabascan, Eskimo, Iroquois, Muskhogean, Pawnee, Pueblo, Salish, Shoshone, Siouan; (2) Central America: Cuna, Lencan, Maya-Quichè, Mixtec, Nahuan, Opata-Pima; (3) S. America: Antisuyu, Araucan, Arawak, Aymara, Bororo, Botocudo, Carib, Chibcha, Chiquito, Choco, Chuncho, Fuegian, Jivaro, Mataco, Pano, Payagua, Puelche, Quichua, Tehuelche, Ticuna, Toba, Tupi-Guaraní, Warrau, Zaparo. The largest remaining tribes are the Sioux, Cherokees, Choctaws, and Creeks. Over 60 different languages, all polysynthetic, have been recorded in N. America.

At present there are about six million Indians in N. America, Mexico and Central America, about 4½ million in S. America, in both cases including half-breeds, of which there are about 1½ million in S. America, where, however, the estimate of the Ind. population is only a rough one, owing to the amount of almost unexplored forest region. The half-breeds of N. America belong chiefly to the 'Five Civilized Tribes,' of whom *c.* 60,000 (*i.e.*, two-thirds) are pure Indians. Excluding Alaska, there are about 300,000 pure Indians in the U.S., mostly resident in Ind. reservations (tracts of land set apart for their habitation), the chief being in Arizona, S. Dakota, Montana, and Oklahoma. Alaska has *c.* 30,000 Indians. The very few Indians who have abandoned their tribes in the U.S. pay taxes but have no political rights. The Indians of Arizona and New Mexico, who are U.S. citizens by treaty, exercise no political rights, and have so far shown no political interest. The total Indians of Canada are *c.* 111,000. The various estimates of the numbers of Indians vary, but seldom fall below the figures given above. The various stocks are characterized by copper-colored skin, lank black hair, high cheek bones, long, deep-set eyes, and powerful, often aquiline noses. They vary in stature and development, the finest specimens being found among the Patagonians of S. America and the Iroquois, Pawnees, and Sioux of the U.S. and Canada.

Before they were ousted by Europeans they were skilled hunters, trained observers, of extraordinarily acute senses, capable of enduring without a murmur great hardships and torture, which they freely employed on others, and they have never shown any liking for European comforts or any sympathy with European ideals. Most of them were still in the Stone Age when Columbus landed. Iron seems never to have been known to the makers of the old civilizations of Peru and Mexico. The Indians are of the utmost importance for the study of primitive institutions and religions, and this importance has been recognized in late years by a growing number of students. The matriarchate was common, if not universal, and at the close of the XVIII. cent. European commissioners still found that the tribe was to be treated with through its head women; polygamy is rare, monogamy the rule; the chieftainship was very rarely hereditary, the strongest man of the tribe being chosen by varying systems of election. The 'medicine-men'—*i. e.*, magicians—have great power. Their tales of the Creation are interesting as giving prominence to the Deluge. Their well-known belief in a future happy hunting-ground seems widely spread, but is not universal. The ghosts of the dead take animal forms or appear as skeletons or unsubstantial bodies, and may inflict harm on the living. Many tribes believe in reincarnation as human beings. In their creed is a strong element of animism, but over all deities and spirits is 'Atiuch' or the 'Father' or 'Manito,' to whom alone direct prayer is offered. He is sometimes conceived as the sun. Corn is worshipped, credited with miraculous powers, and named the 'Mother.'

Reverence for certain animals, the white eagle, beaver, buffalo, etc., is seen in the curiously picturesque names of chieftains and braves—White Bear, Many Horses, Buffalo Ribs—and in names of women, such as White Antelope.

In the XVII. and XVIII. cents. the British and French were continual rivals for the favor of the Indians, and the dispatches of Eng. colonial governors to the home government often express admiration of Fr. methods of dealing with the natives. There were 'friendly' or Brit. Indians and Fr. Indians. The early colonists lived in constant dread of the

'Indian peril,' and the state of New York was particularly exposed until Fr. alliance with the Algonquins led to the Iroquois becoming firm friends of the British. These two peoples played an important part in the history of N. America. The Iroquois inhabited the district round St. Lawrence R. and the Great Lakes, part of New York state, and lands in Virginia, the Carolinas, and Georgia. Their tribes included the federation formed by Hiawatha, important in Brit. colonial history as the Five Nations, which became Six Nations by the accession of the Tuscaroras. The Cherokees of this stock were the chief tribe with which the Carolinas and Virginia had to deal in the XVIII. cent. They were transferred bodily to the other side of the Mississippi in 1838. The Iroquois, however, by their bitter enmity to the French in Canada, did much towards the establishment of Brit. N. America. The Athabascan tribes were of great importance in western N. America; the Apaches and Navajos are said to be able to run down the deer while hunting, and the grim, mysterious, and skilled Apache has given his name to the Parisian thug, while Navajo blankets are widely known. The Siouan tribes formerly spread over the N. and center of the present U.S. To this stock belonged the now extinct tribe of Catawbas, prominent in the history of S. Carolina, and it includes the Assiniboines and famous Dakotas, or confederate Sioux, who were allies of the British in the XVIII. cent.

The Sioux, roused by a religious prophet, gave much trouble in the late XIX. cent. General Custer was slain by a force under Sitting Bull while invading Sioux territory, in 1876, but they were put down by Sheridan, and in 1889, sold 11,000,000 ac., parcel of the Dakota reservation, to the U.S. A rising in Badlands, S. Dakota, followed immediately after, 1890, other tribes joined and the Indians laid waste surrounding territory. Before the close of the year General Miles's forces captured and slew Sitting Bull, his son, Crow Foot, etc. A small heroic band under Big Foot sought to revenge Sitting Bull's death, but were exterminated at Wounded Knee Creek, 1890; further forces surrendered to Crook and Miles, 1891. Risings of the Chippewa, 1892, and Navajo, 1893, followed. Unrest seems to have ceased with the union of Indian Territory and Oklahoma in the state of Oklahoma, 1907.

INDICATOR, an instrument for recording diagrammatically on a card the behavior of steam in the cylinder of an engine. The piston is connected with a lever, the end of which carries a pencil (usually a brass point) for making the diagram. The actual movement of the piston is magnified in the diagram. The indicator card (of metal) is wrapped round a drum, which is made to oscillate on its axis, being connected with the crosshead of the engine by a cord passing round a groove at its base. Various springs serve to adjust the indicator cylinder to varying conditions. The expansion and compression curves thus obtained are in the form of rectangular hyperbolas.

INDICTMENT, the charges preferred in writing for offenses in law punishable upon summary conviction, or after trial by jury, constitute an I, and the counts of an I, are its several parts, charging distinct offenses. Indictable offenses must be tried before a jury and the accusation must be set down in writing.

INDIES, LAWS OF THE, name applied either to Span. colonial law code in general, or to the special codes of certain colonies.

INDIGESTION, see DIGESTION.

INDIGO is a dye-stuff which exists in the leaf of plants of genus *Indigofera*, natural order *Leguminosæ*, as a glucoside *indican*, $C_{14}H_{17}O_6N_3H_2O$. An enzyme in the leaf acting on a water extract of the colorless glucoside in presence of atmospheric oxygen gives indigotine, the coloring matter of indigo. About one-half per cent indigo is obtained from leaves and after evaporation sold as 3-in. cubes. A 20 per cent paste made by melting the carboxylic acid of phenylglycocoll with caustic alkalies has supplanted the natural Indian product.

INDIGO BIRD (*Cyanospiza cyanea*), a small bird of the finch family, native of the U. S. A. It is about 5½ in. long, the adult male of a beautiful blue color, whilst the female and young are of a bluish grey. It has a sweet song, something like a canary, and frequents open spaces.

INDIUM. — In. Atomic Weight, 114.8. A metal belonging to the aluminum group, and first discovered in 1863, by Reich and Richter in zinc blende. It is a white metal, softer than lead and easily malleable. It is not affected by air or by moisture. It has a specific gravity of 7.1 and a melting point of 155° C. It can be obtained from the oxide by reduction in a current of hydrogen, or by fusion with sodium, or it can be prepared electrolytically from solutions of the chloride, nitrate or sulphate. It dissolves slowly in hydrochloric and dilute sulphuric acid, but rapidly in nitric acid. When heated on charcoal in the blowpipe, it gives a blue coloration

to the flame and forms an incrustation of oxide. It combines with selenium and tellurium, forming black metallic masses.

INDIVIDUALISM, view that governmental interference with conduct of individual citizens should be jealously restrained; opposed to collectivism and socialism.

INDO-ARYAN LANGUAGES, important group of seven languages—Hindi, Marâthi, Bangâli, Panjâbi, Gujrâti, Sindhi, Uriya—belonging to Indo-European family. All descended from Sanskrit (*q.v.*), to which they bear same relation as European Romance languages to Latin, and from which principal portion of vocabulary and whole inflectional system are derived. Usual theory is that they arose from Prakrits, or local dialectical forms of Aryan speech (Sanskritic and non-Sanskritic), which received great stimulus from adoption as medium of Buddhist teaching.

Three classes of materials entered into formation of Indo-Aryan languages: (1) *Tatsama*, words unaltered from pure classical Sanskrit; (2) *Tadbhava*, words Sanskrit and Prâkrit, much changed in process of derivation; (3) *Desaja*, words obtained by contact with aboriginal and other races conquered by Indian Aryans.

In first few cent's. A.D., change took place from synthetic to analytical. Alphabets employed are all varieties of Devanâgari (Sanskrit). Most important of seven languages is Hindi, which, written in pure Devanâgari, spoken by *c.* 100,000,000, understood throughout N. India, bids fair to become national language. There are two varieties of Hindi, western and eastern, Hindustani (*q.v.*), being dialect of former.

Distribution.—Hindi, United Prov., Central Prov., C. India, Panjab, etc.; Bengâli, 50 millions, Bengal;, Panjâbi, 17 millions, Panjab; Marâthi, 19 millions, Bombay, Haidarabad, C. Prov.; Gujrâti, 10 millions, Bombay, Baroda; Uriya, 10 millions, Orissa; Sindhi, 3 millions, Sind.

INDO-CHINA, Fr.; general term for Fr. colonial possessions in S.E. peninsula of Asia (8° 30′-23° 25′ N., 100°-109° 20′ E.); consists of five states—the colony of Cochin-China, protectorates of Annam, Cambodia, Tongking, and Laos—and Kwang-Chau. Was leased from China for 99 years, 1898, in addition to territory around Battambang ceded by Siam, 1907. Area, *c.* 256,000 sq. m.; pop. 16,990,000, of whom 23,700 are Europeans. The region is under a gov.-gen., and each state has a resident superior or lieutenant-governor for executive purposes, except Cochin-China, which being a direct Fr. colony has a governor at its head. In 1887 further unity was imparted to Indo-China, when Annam, Tongking, and Cambodia, were united into a customs union; but financial and political unity was not established until 1898. The principal exports are rice, products of fisheries, maize, cotton yarn, pepper, coal, hides, rubber, and sugar. There are about 1,000 m. of railway open, and goods can go direct from Haipong to Yün-nan, 538 m. The beginning of French influence in S.E. Asia may be traced to missionary efforts, begun in XVII. cent. in Siam, whence they spread to Tongking and Annam. The revolution in France retarded progression, and it was not till 1861-2 that French became masters of principal part of Cochin-China. In 1882, the third republic resolved upon a highly aggressive policy, and from that year the French steadily pressed their conquests until they possessed all the country E. of the Mekong. See Map of S. Asia.

INDO-EUROPEAN LANGUAGES are a group of languages with certain characteristics in common, and otherwise called Aryan, or Indo-Germanic. The following are the Indo-European languages: A., the so-called *Centum* group—(1) Greek, (2) Italic, (3) Celtic, (4) Germanic or Teutonic (including Swedish, Danish, Norwegian, Icelandic, English Frisian, Dutch, Flemish, German); B., the so-called *Satem* group—(1) Aryan (including Sanskrit, Zend, and Old Persian), (2) Armenian, (3) Balto-Slavonia group (including Old Bulgarian, Russian, Servian, Polish), (4) Albanian.

The resemblances between these languages of Europe and Asia force on our attention the problem of their hist. connection, their relation to the original language, and the original land of the parent race. Round these problems there have been long and divers controversies. Some claim the East as the orignal home of the languages; others claim the West; the claims for the East being older. The obviously great antiquity of the language of the Hindus was the basis on which the theories of an Eastern origin were built. Linguistic evidence seemed to point to Central Asia as the original home of the parent race. But claims began to be put forward for Europe, and various tracts were suggested as the original home, *e.g.*, South Russia, West Germany, the region of the Baltic, and Scandinavia.

The inhabitants of Europe may be divided into two distinct classes—the dolichocephalic and the brachycephalic, and the pivot of the problem is ultimately which of these two classes is the Aryan. Modern opinion seems to favor the dolichocephalic race; or, to be more exact, European civilization and culture

are regarded as derived from the Aryan race, the tall, fair, dolichocephalic peoples most purely represented today by the English, Germans, and Scandinavians. This theory is technically called Aryanism.

INDONESIAN, Indo-inhabitants to be found in Malaysia, etc.

INDORE (22° 42′ N., 75° 54′ E.); native state, Central India; consists of various isolated tracts; capital, Indore; commercial centre. Pop. *c.* 850,000.

INDORSEMENT, ENDORSEMENT, writing on back (Lat. *dorsum*) of document as descriptive, or, in case of money, as quit claim, the possessor becoming owner.

INDO-SCYTHIANS, Asiatic races of N. India.

INDRA, Hindu deity represented as covered with eyes and riding on an elephant.

INDRE (46° 50′ N., 1° 30′ E.), department, Central France, formed principally from ancient province Berry; surface flat; watered by the Indre; produces cereals, fruit, wine; capital, Châteauroux. Pop. 287,673.

INDRE-ET-LOIRE (47° 16′ N., 0° 45′ E.), department, Central France, formed principally from ancient province Touraine; produces grain, fruits, wine; capital, Tours. Pop., 1921, 327,743.

INDUCTION, in logic, the process of reasoning from particular instances to a general law; the opposite of *Deduction* (*q.v.*).

INDUCTION. — Electrification or magnetization may be produced in a body merely by its proximity to a charged or magnetized object. Electric currents may be set up in a closed circuit by changing the intensity or direction of a magnetic field in the vicinity. Such phenomena are called induction.

To illustrate.—If a charged body, *A*, be brought close to an object, *B*, which is not charged, a charge is *induced* on *B*. Those parts, *B*, which are closest to *A* acquire a charge opposite in kind (sign) to that originally present on *A*, while the more remote parts of *B* hold a charge similar to the original. When the bodies are separated the induced charge disappears. Similarly, if a bar of magnetizable material be held close to one pole of a magnet, the bar becomes magnetized, the ends acquiring opposite polarities. The end nearer the magnet is of polarity opposite that of the adjacent pole (of the magnet). If the material of the bar is such that it does not easily retain magnetism, its magnetic properties disappear when it is moved away from the magnet.

If a magnet be plunged into the center of a coil of wire, the ends of which are connected, a current will flow in one direction on the coil while the magnet is being inserted into the coil, and in the other direction while the magnet is being withdrawn. If an electro-magnet is used, currents may be *induced* in the wire by allowing the magnet to remain stationary in or near the wire while the strength of the magnet is varied. When the strength is being increased, currents will flow in the coil in one direction, and in the other direction while the intensity of the magnetic field is being decreased. While the magnetic field remains constant no currents are *induced* in the coil.

INDUCTION COILS utilize the principle of electro-magnetic induction to convert a low potential uni-directional current into a high potential oscillating current. They consist of a core of soft iron wires, on which are wound two coils of wire, one primary and one secondary, and a means of rapidly making and breaking the primary coil circuit. The primary is usually wound next the core and consists of comparatively few turns of heavy wire; the size and the number of turns depend on the voltage to be applied to, and the voltage to be produced by, the coil.

The secondary coil is composed of a very large number of turns of extremely fine wire, usually wound in sections. These, while separated by good insulation, are wired together so as to form one continuous winding. The interrupter which makes and breaks the primary circuit usually consists of a light iron armature, so placed as to be attracted by the core when it becomes magnetized. This armature carries a platinum or silver contact which rests normally against a similar fixed contact, but is drawn away from it when the armature is attracted by the core. The contacts are is series with the primary circuit, and complete it until the current magnetized the core which attracts the armature thus breaking the circuit. This demagnetizes the core, thereby releasing the armature and again completing the circuit through the contacts. As long as the battery is connected this action continues with great rapidity.

Every time the circuit is made a magnetic field is generated which cuts the secondary coil inducing in it a current in one direction. When the circuit is broken the field is destroyed which induces a current in the secondary in the

reverse direction. These coils are extensively used in the operation of X-ray tubes, ignition systems, and wireless telegraphy transmitters.

INDUCTION MOTORS.—This name designates that type of alternating current motors in which currents are induced in the windings on the rotor of the motor. These in turn generate the magnetic fields necessary to produce rotation.

These motors consist of, 1st., a rotor made up of disks of laminated iron; in slots on their periphery are placed the rotor or secondary winding of copper wire; 2nd., a stator also composed of iron laminations with slots in their inner surface in which are placed the stator or primary windings. The winding on the latter is similar to that of an alternating current generator. The winding on the rotor may (A) be similar to that of the stator, with the ends connected to an external resistance through slip rings; the motor is then called a Wound Rotor Machine; (B) consist of copper bars in the slots referred to above, their ends connected by two rings of copper; in this case the motor is of the Squirrel Cage type. In polyphase motors, when the field is energized, the pulsating fields, generated by each phase combine to form a rotating field. This cuts the rotor windings, generating current in them, the reaction of which causes the rotor to follow the rotating field. The rotor must always lag a certain amount (called the slip), in order that the current may be generated in its windings. Single phase motors will not start themselves, but when started, the rotor windings generate a pulsating field which combines with that of the stator, resulting in a rotating field which produces the action noted above. There are two common methods of starting single phase motors: (1) 'shading coils' of high impedence, so wound on the stator as to produce an out-of-phase magnetic field, which combines with the main field to produce a rotating one; (2) the motor is started as a repulsion motor and after attaining a certain speed the brushes are lifted and the windings short-circuited by an automatic device.

INDULGENCE, in R.C. theology the remission of the temporal punishment which often remains due to sin after its guilt has been forgiven.' Pope Urban II. granted a plenary I. for the first crusade, 1095; and since then I's, plenary or partial, have been frequent. The abuse of I's was one of the signs of decay of the mediæval Church. According to the official R.C. view the Saints have done more than was necessary in expiation of their own sins, and the benefit of this can be transferred to others.

INDULINES are amidated azonium salts which dye blue, bluish-red, and black. Rosindulines and Napthindulines are basic. The salts give red fluorescent solutions.

INDULT (from Lat. *indulgere*, to permit), papal license for non-performance of religious duty.

INDUNA, Kaffir magnate.

INDUS (24° N., 67° 30′ E.), river, India; rises in S.W. Tibet near sources of Sutlej; general course N.W. through Ladak, Kashmir, etc.; turns S.W. in N.W. Frontier Province, flows through Punjab and Sind, and enters Arabian Sea by numerous mouths; chief tributaries, Zanskar, Shayok, Kabul, and Punjnud (five united rivers); delta begins at Hyderabad (chief town); total length, 1,800 miles; navigation begins near Attock; drainage basin, 375,000 sq. miles; fish and crocodiles abound; subject to great floods.

INDUSTRIA (*c.* 45° 10′ N., 8° E.), ancient town, Liguria, Italy.

INDUSTRIAL CHEMISTRY. See CHEMISTRY, INDUSTRIAL.

INDUSTRIAL EDUCATION. See VOCATIONAL EDUCATION.

INDUSTRIAL SCHOOL, voluntary school for giving manual and commercial training to the poor.

INDUSTRIAL WORKERS OF THE WORLD, a labor organization based on 'industrial union' principles and on the theory of syndicalism. It was organized in Chicago, in 1905, by a group of radicals, discontented with the compromising spirit of the crafts unions. It differs from the latter in that organization is by industry, rather than by craft; it insists on a transfer system, enabling itinerant workers to join locals whenever they arrive in new locatities; low iniation fees and monthly dues; salary of officers not to exceed average wage of workers; no contracts or agreements are signed with employers; and no big union treasuries are sanctioned. It advocates the general strike as a weapon of offense and defense, and it stands unequivocally for the abolition of the capitalist system, for which is to be substituted what is called syndicalism; industries to be governed democratically by the workers themselves, each industry to be more or less autonomous. In 1917 the organization had a membership of about 100,000 recruited principally among the lumber workers of the N.W., the metal mine workers in the Rocky Mountain region and among the agricultural workers. It has conducted many important strikes, notably

in Lawrence, Mass., among the textile workers, in 1911, and among the silk workers, in Paterson, N. J., in 1912, and in 1917, among the lumber workers in Washington, Idaho, and Montana. The Thirteenth Convention of the organization was held in Chicago, in May, 1921, and while there was no lessening of the spirit of militancy, it was obvious that there was a substantial decrease in membership.

INDUSTRIAL MANAGEMENT, a science which has developed with the growth of large-scale industry. Formerly the manufacturer set up his manufacturing plant under his personal management and sold his goods on the open market, the result being largely a matter of chance. With increased output, personal supervision became less possible on the part of the individual owner, and scientific system became as imperative as in the administration of a state or municipality. There thus developed the 'efficiency engineer,' whose business it is to serve the large business enterprise in a consultative capacity, making periodical surveys of the business organization as an accountant examines the books. The science is divided into four main phases: (1) finance; (2) production; (3) selling; and (4) personnel, the latter being the human and most uncertain element. The first and second elements belong more properly to banking and applied science, and it is therefore that the marketing of goods and the personnel of the organization concern the efficiency engineer more deeply. The first, selling, has developed into a specialty involving a profound knowledge of the distributive processes of the economic system, as well as the psychology of the purchasing public, including that important aspect of it, advertising. In this latter field large, elaborately organized firms specialize separately, taking full charge of this phase of their business for many large corporations. Here the study of organs for publicity is conducted with the same intensive effort that the geologist studies rock formations. The other chief aspect of selling is salesmanship, which is usually carried on by each manufacturing corporation directly, but under the supervision of experts commanding large salaries. Art, or the personal equation, enters into this phase of the administration, rather than science, since it is the personality of the salesman which counts. The head of the sales force, therefore, requires a profound knowledge of human character, not only in picking out the best salesmen, but in choosing the proper raw material from which qualified salesmen may be trained. It is in the fourth phase of Industrial Management, personnel, that the efficiency engineer has the widest scope for the exercise of his profession. This phase may again be divided into two aspects; the psychology of the workers, from the office boy up to the factory foreman; and the arrangement of their labor to the highest point of economy. In the employment bureau of the large corporation which has adopted the up-to-date methods of industrial management, applicants for positions are subjected to long series of psychological tests, from which it is possible, first, to judge whether the applicant is fitted for the work, and, secondly, for what kind of work in the establishment he is most fitted. Studies are also made of the many thousands of movements made on the part of the workers, with the object of eliminating unnecessary effort. This latter phase has at times been carried to such extreme as to defeat its own object, the workers themselves reacting against the system. Another contributing element is the initiation of welfare work among the employees of large establishments, for the psychological effect it has on the efficiency of their labor.

INDUSTRIES, NATIONALIZATION OF. See BOLSHEVISM.

INDY, PAUL MARIE THÉODORE VINCENT D' (1851), Fr. composer, one of the leading musicians of the day, although, owing to choice of subjects, his music does not suit the popular taste so well as that of some of his contemporaries. Some of his works are *Le Chant de la Cloche, 1884*; *Fervaal, 1897*; *Médee, 1898*; *Sauge Fleurei, 1907*; and a study of *César Franck, 1907*.

INE, king of West Saxons fron 688 to 726; issued important code of laws.

INEBOLI (41° 57′ N., 33° 47′ E.), seaport, Asia Minor, on Black Sea; wool and mohair. Pop. 9,000.

INFALLIBILITY, a theological term used of Pope, Church, or Bible, though for the last *Inspiration* is more commonly found. The doctrine of Papal I. is of gradual growth; defined by the Vatican Council of 1870. By this the Pope is infallible when he speaks on faith or morals *ex cathedra*, that is formally and finally as teacher of all Christians. Those who strongly defended this view were called *Ultramontane*: the rejection of it by a small minority led to the formation of the *Old Catholics*.

INFAMY, technical term among Rom. for publicity given to disgraceful conduct; in England legal state of a person once convicted of a crime.

INFANT, in law, means a person, male or female, under twenty-one years

of age. In some legal systems, *e.g.* in those of Ohio, Kansas, and other of the United States, females cease to be Is. at eighteen. Infancy is an important status in the law, more especially in regard to contractual capacity, and responsibility for crime.

INFANTE, title of younger sons of kings of Spain and Portugal, eldest *s.* being called prince.

INFANTICIDE, a common crime in ancient Greece and Rome, and until comparatively recent times (in the matter of female infants) in China and India. It is a capital offense, and when the exposure or abandonment of a new-born child has resulted in death, and a verdict of wilful murder has been returned, the capital sentence is pronounced. But public opinion has long refused to sanction the hanging of a mother who in despair and distraction of mind has abandoned her illegitimate child, and the death sentence is always revised and imprisonment substituted.

INFANTILE PARALYSIS. — Otherwise known as Poliomyelitis or Heine Medins Disease. A disease which chiefly attacks young children, although there are occasional cases among adults. It affects the spinal cord and its membranes and sometimes the brain. It is infectious, especially in the early stages, but the bacterium causing the disease has not yet been definitely isolated and identified. It is believed to be caused by a virus somewhat resembling the virus of hydrophobia, and it is held by many that the disease gains access through the nasal passages. It occurs mainly in temperate zones, and appears as widespread epidemics usually during the summer and early fall, although winter epidemics have occurred. The early symptoms are vague. There is some gastro-intestinal disturbance, or mild respiratory trouble, with headaches and sometimes restlessness and irritability. In two or three days, local paralysis occurs, usually affecting the legs. There is acute inflammation of the spinal cord, causing swelling and pressure on the nerve structures. In very light cases, paralysis may be so slight as to be unnoticeable. In fact, it is believed that many cases go unrecognized, mild poliomyelitis being mistaken for intestinal disorder, and in such cases there is much danger of the disease being spread among other children who may devlop the more serious symptoms. The disease reaches its acute stage, as a rule, within the first eight days, but recovery is usually slow. Comparatively little is known regarding the methods of treatment. Ergot is sometimes used with good effect and sera have been prepared and successfully employed in many cases. The treatment of the resulting paralysis meets with varying degrees of success. In some cases, the lower limbs cease to develop and become practically lifeless, showing little or no improvement after years of treatment. In other cases a slow but steady improvement is noticed, and recovery may be practically complete. The treatment most favored is scientific exercising along lines which develop, in the patient, a conscious will to perform movements. Electrical treatment and massage are sometimes used, but are considered of little value by many authorities.

INFANT MORTALITY, term technically used to denote the number of infants who die within one year from birth and the proportion that these deaths bear to the death rate of the entire population. Stastistics in the United States are much less accurate on this subject than in many countries abroad. The different States vary in the strictness of their laws regarding these matters and the vigor with which they are enforced. In some states where excellent laws obtain, they are only in part obeyed. Reliance has to be placed therefore on records from a sufficient number of large cities, where, as a rule, the figures are fairly complete, and an average of which gives sufficient ground for generalization. It is known that about 2,500,000 babies are born in the United States every year. A much larger proportion of these die within the first year than in any other period of existence. They also die more frequently where the population is most dense. Some of the causes for the high infant mortality are premature birth, heredity, intemperance, too early marriage of parents, neglect, ignorance. lack of hygienic surroundings, and the many infantile diseases that break the babe's fragile hold on life. Of these causes, perhaps unsanitary conditions are the most fatal. Contrasting towns of the same State, Fall River and Lynn, Mass., the rate of infant mortality is 239.7 per thousand in the former, and only 140.7 per thousand in the latter. The first is overcrowded with tenement houses; the second has better buildings, larger open spaces, and the parents are engaged in healthier occupations.

In 1920, out of a population of 27,433,479 in leading American cities, the total deaths were 372,629. Of these, the deaths under one year of age totaled 56,818. The death rate for infants is much greater among the colored people than among the white. In 1920, for instance, 82 white babies and 132

colored babies out of 1,000 of each color born, died in their first year of life. In New York City, the number per thousand dying before the expiration of the first year was 83 white and 157 colored.

A marked improvement in infant mortality is shown in the figures for 1921, where the total deaths in the same cities, though the population itself must have increased considerably in that period, were 327,550, while deaths under one year numbered 48,067. Part of this improvement is due to the housing laws which require a larger amount of air space in tenements; part to the conquests made by science in the treatment of infantile diseases, such as diphtheria, baby pneumonia, and scarlet fever; part to the efforts of health officers of various cities who have established educational centers for mothers on the subject of care of children, and part to the widespread discussion and suggestions in newspapers and magazines. It is too early as yet to assume what effect prohibition will have upon the figures of infant mortality, although it is known that hitherto intemperance on the part of either or both parents has had a most deleterious effect on the vitality of the new born and their chances for life.

INFANTRY. In its largest sense the word includes fighting men on foot of all kinds; in a narrower sense, regularly organized and disciplined foot soldiers. The earliest infantry were the tribal gatherings, and later the militia called to arms in war time for the defense of a state or city. The earliest regular infantry formed the main strength of armies raised by the old empires of the Euphrates and Tigris region and the valley of the Nile. A monument of the former region, the stele of Enneatum in the Louvre, 5,000 years old, shows men armed with helmet, shield, and spear formed up in close order. The Greeks relied on civic militias, trained to athletic exercises as part of the ordinary education of the younger men, and sufficiently drilled to move in broad column with levelled spears in front. Philip of Macedon developed this formation into the phalanx, armed with long pikes, so that the weapons of three ranks projected from the front of the attacking column. But the mass had little manœuvring power, and was not adapted to meet a flank attack. The flanks of the phalanx were covered by more mobile, light-armed detachments. The Romans of the republican period, however, developed a new infantry organization and tactics which in a comparatively short time enabled them to defeat both the Gr. and the Carthaginian armies, which derived their infantry methods from Gr. mercenaries. The Roman legion was essentially an infantry force with a small cavalry detachment. The rigidity of the phalanx was avoided. The maniples, or companies, were drawn up, not in an unbroken line, but with intervals between them, and behind these intervals were placed the companies of the second line. The men were not closely locked together, but given room to use their weapons freely. The short, heavy spear of the legionary as not a pike but a javelin. It was hurled at close quarters, and then the short-bladed sword was drawn, and, covered by his shield, the soldier closed with his adversary before he could recover from the impact of the spear. The legionary was a swordsman, and once the volley of spears and the rush of swords broke anywhere into a hostile line the company could hew its way to right or left, while company after company broke in to reinforce the attack on the crumbling line or mass of the enemy. These tactics made the Romans masters of all the Mediterranean world. The legionary was also trained to entrenchment work, and carried a heavy load of baggage, so that transport was reduced to a minimum.

During the decline of the empire there was a growing dependence on mercenary troops enlisted from 'Barbarian' nations, and the cavalry arm was increased to cope with the mounted raiders of the new peoples that were pressing on the frontiers. With the coming of invaders from eartern Europe and from Asia, largely mounted warriors, cavalry became more important than infantry, and through the earlier Middle Ages the heavily armed man-at-arms was the main strength of armies. Infantry began again to become important in the XIV. cent., when the Swiss Confederates showed that an array of pikes and halberds could defy the mounted men; the militia of the Flem. cities gave the same proof of the power of steady infantry; and the Eng. archers proved that the arrow flight could destroy charging knights and men-at-arms before they could come to close quarters. The introduction of musketry added to the value of the foot soldier, and the first regular regiments of infantry, the Span. *tercios* of the XVI. cent., well-disciplined bodies of musketeers combined with pikemen, were for nearly a hundred years all but invincible in pitched battles. In the XVII. cent. the invention of the bayonet made the protection of the pikemen no longer necessary for the musketeer, and infantry began to assume its modern form, while at the same time the cavalry began to form a less and less numerous element of regular armies, and became at

last an auxiliary arm. The XVIII. cent. saw the introduction of light infantry or skirmishers, fighting in dispersed order to cover the advance of the closed bodies of infantry, and as fire effect increased through the improvement of the musket, the line became a reliable fighting formation. In the XIX. cent. the introduction first of the rifle, then of the breech-loader and magazine rifle, increased both the range and efficiency of infantry fire, and made the cavalry charge against steady infantry hopeless, and the foot soldier, assisted by artillery fire, became the battle winner. With the increase of infantry fire effect, close-ordered movements on the battlefield gave way to various forms of dispersed order, and the use of cover and entrenchments. Infantry is now the main strength of all armies, and even the cavalry soldier is armed with the rifle and trained to fight on foot.

INFECTION. See Disease, Germ Theory of.

INFERNAL MACHINES, a name given to mechanical contrivances with a dangerous explosive and used for a nefarious purpose. Such machines are generally made to look quite harmless and frequently have some clockwork arrangement by which the explosive is fired after a certain lapse of time.

INFINITE, that which is without end. It is impossible to conceive a point in past time without something before, or in future time without something after; so also in space; hence idea of infinity. But infinity cannot be imagined. Some assert space and time are finite.

INFINITY, perhaps the most difficult conception mathematicians have to make. Infinity is defined as being that quantity which is greater than every assignable quantity, and is denoted by the sign ∞. It is most easily conceived as a limit, *e.g.* as the quantities $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\ldots \frac{1}{n} \ldots$ get smaller and smaller, so n gets larger, and larger and the limit to which n tends, as the infinitesimal $\frac{1}{n}$ tends to zero, is ∞. In higher geometry parallel lines are those which meet at infinity, and the asymptotes of an hyperbola are the tangents to the curve at points on it infinitely distant. All points at infinity are on the line at infinity, whose equation in areals is $x+y+z=0$, and all circles pass through two imaginary points known as the circular points at infinity.

INFIRMARY, see Hospital.

INFLAMMATION may be defined as the reaction of the tissues to an irritant; and the term irritant includes physical and chemical agents, heat and cold, a crush or a blow, as well as those toxic agents known as micro-organisms. Celsus (*b.* about 50 B.C.) is said to have enumerated *rubor*, *tumor*, *calor*, and *dolor* ('redness,' 'swelling,' 'heat,' and 'pain') as the four marks of inflammation; and although these four cardinal signs are not necessarily all present in every inflammation, they to some extent furnish an index to the severity of the process. Interference with function also occurs. The result of irritation of the tissues is dilatation of the vessels and escape of white blood corpuscles or leucocytes into the tissues. Metchnikoff has demonstrated the destruction of bacteria by these white blood-cells. In the course of this struggle many of them die, and pus consists of myriads of these dead corpuscles. The most favorable termination of acute inflammation is resolution, which leaves practically no material trace of the process. In many cases, however, acute inflammation subsides into a chronic state. If at all extensive, acute inflammation is attended by rise of temp. and by general malaise, especially when pus is formed and retained in a confined space. Rigors may follow the formation of pus, or the spread of the inflammation and the septic organisms by the lymphatics to new centers of infection.

Treatment.—As far as possible the affected part should be put at complete rest; the local application of heat, a sharp purge, and a milk diet are usually indicated. If suppuration occurs, free incision is called for.

INFLORESCENCE, in plants, is the manner in which their flowers are arranged. The simplest form of all is a solitary terminal flower, *e.g.* daffodil, but more often there is a more or less complex system of branching (*q.v.*) in which the branches do not develop into foliage-shoots but bear flowers. The stalk upon which the flowers are borne is known as the *peduncle* or *rachis*; if the flowers spring directly from the peduncle they are said to be *sessile*, but if they depend from a secondary stalk they are said to possess *pedicels*. An I. found at the apex of a shoot is *terminal*, if found in the axils of leaves it is *axillary*.
noted for eloquence.

INFLUENZA, an acute infectious disease caused by a specific bacillus, *Bacillus influenzæ*, characterized by fever and by symptoms affecting the respiratory, digestive, or nervous systems. It occurs in epidemics, appearing most fre-

quently in the winter months, and has spread, at one time or another, to practically all parts of the world, adults between the ages of twenty and forty being attacked most often, children and aged persons less frequently. Infection is from the secretions of the mucous membrane of the nasal passages and the trachea and bronchial tubes. The incubation period of the disease is from two to six days. The onset is sudden, with pains in the back and loins, and headache, often accompanied by giddiness and nausea or vomiting. The temp. rises quickly, varying from 100° to 104°, and a feeling of weakness and discomfort is marked. After a few days the disease may assume one of four varieties: *respiratory*, with bronchitis or broncho-pneumonia developing; *gastro-intestinal*, with pain in the abdomen, vomiting, and diarrhœa; *nervous*, with great depression, insomnia, severe headache and other pain, irregular heart, and perhaps delirium; *febrile*, with pronounced prostration and high temp., especially in children. The death-rate in proportion to the number of cases is not high. In the epidemic of 1890 it was 1.6 per 1,000. But in the extraordinary epidemics of so-called 'Spanish influenza,' which swept across the whole world in 1918 and 1919, this mortality was greatly exceeded. Most of the fatal cases were complicated by pneumonia. There were severe epidemics of influenza in the United States in 1921 and 1922.

The treatment is rest in bed, warmth, and nourishing foods, complications being treated as they arise. For the pains at the commencement of an attack, salicylate of soda is valuable, phenacetin if headache is pronounced, while quinine, phenol, and a host of other drugs have been employed. Vaccines, both prophylactic and curative, have been tried, but the evidence of their value is not conclusive.

INFORMER, legal term for person who brings a suit against another as a law-breaker; a *common I.* is one who shares the profits of convictions. The system was brought to an art in the later Rom. Empire, and was common in Ireland during the XVIII. and XIX. cent's.

INFUSORIA, the highest class of Protozoa, with many members which are among the most familiar of the group. Their name is due to the fact that, where any infusion of vegetable matter is exposed to the air, Infusoria abound therein in a short time. As the other classes of Protozoa are distinguished by the presence or absence of characteristic locomotor organs, so the infusorians are known by the coating of fine, short, vibratile hairs or cilia, which, present often in hundreds or even thousands, enable them to swim through the water or glide over solid substances. The free-swimming forms are generally round or oval in shape, while the gliding forms are flattened, with a permanent creeping surface; but the essential structures are the same—a protoplasmic body formed of external ectoplasm and internal endoplasm, containing usually two nuclei (*macronucleus* and *micronucleus*), food vacuoles and numerous contractile vacuoles, and furnished frequently with a mouth and œsophagus which guide the food to the endoplasm.

As is often the case in Protozoa, the bodies of many Infusoria are preserved from desiccation in continuous dry weather by the formation of a protective covering—*encystment*—but this process is also related to reproduction and to lack of food. When encystment precedes reproduction the contents of the cyst break up into very many minute individuals; but a more usual mode of reproduction is that of simple division, where an individual splits into two—crosswise if free, lengthwise if fixed.

Most Infusoria live in the sea or in fresh water, where they swim independently or are attached to rocks, seaweeds, zoophytes, etc., by means of a long contractile stalk or by adhesive organs, or simply by modified cilia. They live on small organisms, such as bacteria, diatoms, and minute Protozoa, which are wafted towards the mouth (where it is present) by the continuous action of the neighboring cilia. Some Infusoria are parasitic, and live in the bodies of other animals, upon the juices of which they feed. The parasitic forms, however, do little apparent harm, with the exception of one form (*Ichthyophtheirus*), which occasionally causes fatal epidemics amongst fresh-water fishes.

The class Infusoria falls into two distinct groups:—

Sub-class I., *Ciliata*, in which cilia occur throughout life—some without mouths (*Astomata*), such as *Opalina*, parasitic in the food canal of frogs; or the group of *Gymnostomata*, with simple porelike mouths; or the large permanently open-mouthed *Hymenostomata*, of which the common slipper animalcule or *Paramœcium* is a member. Or there are forms distinguished by a spiral band of well-developed cilia which leads to the mouth (*Spirigera*), including the sedentary *Stentor*, which has a body covered with an even, fine coating of cilia, and which builds a gelatinous tube within which it can withdraw for refuge; the closely related sluggish *Balantidium*, parasitic in the human food canal; or

the stalked forms, such as *Epistylis*, with a stiff, rigid stalk, or *Vorticella*, with long stalk which contracts spirally under excitation.

Sub-class II. *Suctoria*, with cilia only during the early stages, the functions of these being taken up, in the adults, by peculiar suctorial tentacles. Such are flattened forms with branched arms, as *Dendrocometes*, or stalked species with knobbed tentacles, as *Acineta*.

INGALLS, JOHN JAMES (1833-1900). American lawyer; *b.* in Middleton, Mass., December 29, 1933; *d.* at Las Vegas, New Mexico, August 16, 1900. Graduating from Williams College in 1855 and admitted to the bar in 1857, he practiced law at Atchison, Kansas and was a delegate to the first Constitutional Convention. Secretary of the Territorial Council, 1860; to the State Senate, 1861; state senator, 1862. In the Civil War he was judge-advocate to the Kansas militia, 1863-1865, and for three years edited the 'Atchison Champion.' The Republicans elected him U.S. senator, 1873, 1879, and 1889. Charges of bribery were brought against his election in 1879, but he was exonerated. President pro-tem. of the senate in 1887. He was defeated for senator in 1891 by the Farmers Alliance. He was noted for eloquence.

INGE, WILLIAM RALPH (1860), Dean of St. Paul's. London, since 1911; formerly Lady Margaret prof. of divinity, Cambridge, 1907-11; Gifford lecturer at St. Andrews, 1917-18. Has written numerous works, including *Society in Rome under the Cæsars, 1886*; *Studies of English Mystics, 1906*; *The Church and the Age, 1912*; *The Philosophy of Plotinus, 1918*.

INGEBORG (*c.* 1176 to *c.* 1238), queen of France, whose repudiation by Philip Augustus led to his excommunication, 1196, and the placing of France under an interdict.

INGELHEIM, NIEDERE, AND INGELHEIM OBER (*c.* 49° 58′ N., 8° 6′ E.), two small contiguous towns, Hesse, Germany, on Selz; wine. Pop. 3,853 and 3,500.

INGELOW, JEAN (1820-97), Eng. poet and novelist, who became known by publication of poems in 1863; her best-known novels: *Off the Skelligs* and *Fated to be Free*.

INGEMANN, BERNHARD SEVERIN (1789-1862), most popular Dan. poet and novelist of his day; his writings are somewhat mawkish, but graceful and finished.

INGENOHL, FRIEDRICH VON (1857), Ger. sailor. He became admiral of High Seas Fleet, 1908. In January, 1913, he was promoted to the commandership-in-chief of Ger. navy, and retained this position until after the battle of Dogger Bank, Jan. 24, 1915, when he was superseded.

INGERSOLL (43° 3′ N.; 80° 58′ W.), town, Ontario, Canada, on Thames; agricultural implements; furniture. Pop. 5,000.

INGERSOLL, ERNEST (1852), American naturalist; *b.* in Monroe, Michigan, March 13, 1852. He was educated at Oberling College, the Lawrence Scientific School, and the Museum of Comparative Zoology, Harvard. Appointed an expert by the U.S. Fish Commission he became noted for his writings and lectures on scientific subjects. An officer of the National Association of Audubon Societies. He edited the 'Farmer's Practical Library.' Author, *Nests and Eggs of North American Birds, 1880-1881*; *Oyster Industry of the United 1881*; *Knocking 'Round the Rockies, 1883*; *The Crest of the Continent, 1884*; *Wild Neighbors, 1897*; *Book of the Ocean, 1898*; and *Wild Life in Orchard and Field, 1902*; *Wit of the Wild, 1906*; and *Animal Competitors, 1911*. He also wrote books for young people.

INGERSOLL ROBERT GREEN (1822-1899), and American lecturer; *b.* in Dresden, N. Y. At the age of twelve he accompanied his family to Illinois, where he studied law and becan to practice, in Peoria. He became interested in politics and joined the Democratic Party, but after the Civil War, during which he served in the Federal Army as a colonel of volunteers, he became a Republican, because of his anti-slavery sentiments. In 1868 he was Attorney-general of Illinois, and in 1876 he made a speech at the Republican National Convention, held in Cincinnati, which gave him a national reputation. After this period he began to make extensive lecture tours throughout the country, people flocking in multitudes to listen to his arraignment of religion and its institutions. His logic was based largely on the writings of Thomas Paine, but it was his oratory rather than his processes of reasoning which carried conviction to his hoarors. He was a master of irony and invective and probably had more influence than any other man in this country in diminishing the congregations of the churches. He wrote *The Gods and Other Lectures, 1786*; *Some Mistakes of Moses, 1879*; and *Prose Poems and Selections, 1884*.

and metallic salt. They are corrosive. The color develops by oxidation. *Aniline inks* are non-corrosive, and have no sediment, but are fugitive. *Marking ink*, indelible ink for marking linen, etc., is a solution of silver nitrate or other salts. *Secret* or *invisible inks* (*sympathetic inks*) are chlorides of nickel, cobalt, etc., which become visible only on the application of heat or a chemical agent.

INKERMANN, village in the Crimea, 33 miles from Sebastopol; noted for defeat of the Russians by the English and French, on Nov. 5, 1854.

INLAND WATERWAYS. See INTERNAL IMPROVEMENTS.

INLAYING, method of decoration by inserting one material into another, differing in nature or color; different kinds are bidri, damascene, buh' work, marquetry, pietra dura, mosaic.

INMAN, HENRY (1801-46), Amerl. artist, who executed many portraits of celebrities.

INN (48° 34′ N.; 13° 28′ E.), river, Central Europe; ancient *Enus*; rises in Swiss canton of Grisons; joins Danube at Passau; length, 320 miles; navigable to Hall.

INN.—An 'inn' has been defined as 'a house, the owner of which holds out that he will receive all travellers and sojourners who are willing to pay a price adequate to the sort of accommodation provided.' Generally a hotel is an inn. The ale-house, or tavern, is merely a refreshment-house, and a fully licensed public-house is not necessarily an inn. Neither is a boarding-house, for the proprietor of the latter makes what arrangements he, or she, pleases with the boarders. But the innkeeper is bound by law to receive and afford proper entertainment to every one who offers himself as a guest, if there be sufficient room and no good reason for refusal. In the event of neglect or non-fulfilment of duty on the part of the innkeeper proceedings should be taken against the person who is, in fact, the innkeeper.

INNERLEITHEN (55° 37′ N.; 3° 5′ W.), town, health-resort, Peeblesshire, Scotland, seat of Woolen| industry; saline springs (Scot. *Roman's Well*).

INNESS, GEORGE (1825-1894) American painter; *b.* in Newburg, N. Y., May 1, 1825; *d.* at Bridge of Allen, Scotland, August 3, 1894. He displayed high artistic talent from boyhood, and when he opened a studio of his own a liberal patron sent him to Europe, where he spent several years at work in France and Italy. In 1850 he settled at Eagleswood, near Perth Amboy, New Jersey. He ranks with the best American landscape painters, and his pictures are highly prized by collectors. Five of his paintings are in the Metropolitan, New York. Among notable works are: *Close of a Stormy Day, An Autumn Morning, Autumn Gold, Passing Storm*, and *Moonrise*.

INNESS, GEORGE, JR. (1854) American painter; *b.* in Paris, January 5, 1854; s. of George Innes, with whom he studied in Rome, 1870-1874, and then under Bonnat in Paris, in 1875. He exhibited at the National Academy of Design, in 1877, and became a member of the Academy in 1879; awarded a gold medal by the Paris Salon, 1899, and has since been a frequent exhibitor; decorated by French Government. He is best known as a landscape and animal painter. Representative works are, *A Mild Day, 1887*, and *Morning on the River, 1902*. Since 1913 he has had an artistic connection with the *Century Magazine*. Author of *Life, Art and Letters of George Inness, 1917*.

INNOCENT, INNOCENTIUS.—The name of numerous popes, of whom the most important are:—

Innocent I., reigned 402-17; confirmed actions of Synod of Carthage, 416; commemorated in Rom. Church, July 28.

Innocent II., reigned 1130-43; supported St. Bernard against Abelard and Arnold of Brescia.

Innocent III., reigned 1198-1216; one of the greatest of the popes; exercised enormous power; as pope and as an Ital. prince he opposed imperial power; enforced his decisions on marriage question on Philip of France and Peter of Aragon, more significant still were his relations with King John and his putting England under interdict; promoted Fourth Crusade, 1204, and crushed the Albigenses; *d.* soon after presiding at the Lateran Council of 1216. I. was a statesman rather than a theologian, and under him the papacy reached the height of its power.

Innocent IV., reigned 1243-54; engaged in long conflict with Emperor Frederick II., carrying on the lofty ideal of power of Innocent III.; had more personal ambition and less loftiness of aim than his predecessor; promoted study of canon law.

Innocent VI., reigned 1352-62, at Avignon; a firm ruler, he carried through various reforms, but has sometimes been charged with nepotism.

Innocent VII., reigned 1401-06; tried to summon general council in 1404, which never assembled.

Innocent VIII., reigned 1484-92; unsuccessfully preached a crusade; without

real ability, and guilty of nepotism; influenced by Cardinal della Rovere (Julius II.).

Innocent X., reigned 1644-55; condemned the Jansenists, 1653; largely swayed by his *sister-in-law*, Donna Olimpia Maidalchini.

Innocent XI., reigned 1676-89; carried out reforms in papal court, and tried to secure greater simplicity and spirituality in Church life; came into conflict with the Jesuits; took some part in politics, opposing Louis XIV. over *Declaration of Gallican Liberties*, which I. resisted; an unsuccessful attempt was made to canonise him.

Innocent XII., reigned 1691-1700; a reforming pope, tried to abolish nepotism by declaring popes should not give offices to relatives.

Innocent XIII., reigned 1721-24; supported Old Pretender and opposed the Jesuits.

INNOCENT S DAY, CHILDERMAS, Church holiday to commemorate massacre of innocents by Herod; Dec. 28., in Rom. Church; considered unlucky.

INNS OF COURT.—In England, corporate bodies, of which all barristers and students of law must be members. (The phrase is also applied to the buildings belonging to these societies.) Four of these courts exist in London: The *Inner Temple*, the *Middle Temple*, *Lincoln's Inn*, and *Gray's Inn*—all the smaller inns have long been abolished. Each of these societies is governed by a body of benchers. The privileges of the inn are to admit men to become students of law, and to confer the right, by calling them to the Bar, to practise in the Law Courts. Each student, before admission, must pass an entrance examination or produce a certificate from a university, and before being called to the Bar must keep twelve terms (three years) and pass other examinations. In Ireland, King's Inn, Dublin, is the only Inn of Court. In Scotland, there are no Inns of Court, and an advocate, corresponding to the Eng. barrister, is trained in the Faculty of Advocates.

INNSBRUCK (47° 17′ N., 11° 24′ E.), town, Austria, capital of Tyrol; beautifully situated at head of Brenner Pass; seat univ., founded 1677. Among principal edifices are Franciscan Church (with magnificent monument to Maximilian I.), imperial castle, and Ferdinandeum museum; textile and glass-paint industries. Pop., 1910, 53,194.

INNUENDO (from Lat. *innuere*, to nod towards), method of defamation by insinuation which may constitute libel.

INOCULATION, the communication of disease accidentally or intentionally to a healthy subject by the introduction of certain products of disease into the body through the skin or the mucous membrane. The chief diseases so transmitted in man are anthrax, hydrophobia, small-pox, and syphilis. Before Jenner introduced vaccination (*q.v.*), I. of small-pox was practised. The disease as thus transmitted was far less dangerous than the ordinary small-pox, and, further, rendered the inoculated subject much less liable to a future attack. Its disadvantages are obvious, in that it tended to keep the disease alive, and further to increase its spread, but it was invaluable to those who had been inoculated, and was of great service prior to Jenner's discovery. In 1840 the practice of I. with small-pox was forbidden by law. Pasteur's treatment for hydrophobia and all serum injections are based on a similar principle to that explained above.

INORGANIC CHEMISTRY. See CHEMISTRY.

INOUYE, KAORU, MARQUESS (1835), Jap. Meiji statesman, who won some success for European innovations.

INOWRAZLAW, HOHENSALZA (52° 47′ N., 18° 15′ E.), town, Posen, Germany; iron-works; salt-works in vicinity. Pop. 25,695.

INQUEST (Lat. *inquisitio*, search); legal inquiry made by Coroner and jury; held in cases of death from unusual causes.

INQUISITION, THE.—In the IV. cent. the Christian Church, which till then had been persecuted, became itself persecuting. Laws were passed in the Christianised Empire against heretics. In the Dark Ages there was not much persecution, but about the X. cent. rigorous measures were adopted, and in various countries heretics were burnt. It came to be established that heretics, after being condemned by the Church courts, should be handed over to the 'secular arm' for punishment. The Emperors Frederick I. and Frederick II. and Pope Innocent III. urged increased severity. Gregory IX. really created the mediæval inquisition which he entrusted to the Dominicans. The judicial procedure of the I. was quite different from that to which we are accustomed. The accused was assumed to be guilty; he did not know who had accused him, and all proceedings were in secret. Hardly a case is known of complete acquittal, but if the prisoner confessed, he had to suffer various pains and penalties, such as scourging, penance, imprisonment. Torture was frequently used to extort confession, and every effort made to induce the heretic to accuse others also. Those

who were obdurate were liable to be burnt. The heretic's goods were confiscated, the spoils going sometimes to the secular monarch, sometimes to the Church, and occasionally confiscation was so great as to involve impoverishment in a district where the I. had been acted. The I. extended its activities to the suppression of heretical lit. and to magic.

The I. never had a real existence in England, although from the XV. cent. onwards heretics were burned at the stake, particularly in the Marian persecution. In France the Albigenses were suppressed in the XIII. cent. with great cruelty, and the Waldenses in the XIV. In Italy persecution was often for political reasons, and in Germany heretical mystics suffered most.

It is the *Spanish I.*, however, of which the influence was greatest. Owing to the independent policy of Span. kings, the I. never did much in the Middle Ages. It was reorganized by Ferdinand and Isabella, in 1480. Despite its independence of the Holy See it was recognized by the popes. (It is noteworthy that while no country in Europe was more orthodox than Spain, none was so jealous of papal interference.) No class in Spain was exempt from its vigilance, but some came off worse than others—*e.g.* the descendants of converted Moors or Jews were always regarded with suspicion. The Span. I., after having been twice temporarily abolished, finally disappeared, in 1834. Its work had been more thorough and far-reaching in Spain in modern, than elsewhere in mediæval times.

INSANITY, a term applied to certain varieties of mental disease in which the disorder of mind is so severe as to produce disorder of conduct in the affected subject. The term is really more a legal than a medical one, as a certain degree of irresponsibility must exist before the subject may be legally confined against his will. Milder forms of mental disease exist in which the conduct of the patient remains rational. The great aim of modern mental healing (PSYCHIATRY) is to have all cases of mental disease, whether certifiable or not, treated by specialist physicians in special hospitals, unless the patients can bear the expense of having such treatment in their own homes.

Insanity may be due to actual structural disease of the brain, or may be of the nature of an intellectual anomaly which renders impossible the adaptation of the subject to his normal surroundings. In both cases the practical point is that the sufferer from insanity must be forcibly confined in order to protect the community from him, or in order to protect him from the evil consequences to himself of his own conduct.

It has been calculated that among civilized peoples the ratio of insane to sane is about 1 to 300, but the proportion varies in different countries.

The most important cause of most varieties of insanity is a hereditary tendency to mental disease, about 60 to 70 per cent of the insane having a hereditary taint; the predisposition develops into an actual manifestation of disease on an exciting cause arising. The marriage of near relatives does not necessarily produce insanity in the offspring—*i.e.*, not unless there is already a family tendency to the disease. Many bodily diseases are potent exciting causes—*e.g.*, epilepsy, syphilis, alcoholism, influenza, pellagra. Privation, emotional shock, and severe continued strain of all kinds are most important in producing many kinds of mental breakdown. The onset of insanity may also be intimately connected with the following important periods of human life—viz., puberty, adolescence, the climacteric, and the decline of old age. Pregnancy, child-bearing, and lactation must also be mentioned.

The classification of the various types of insanity has gradually been undergoing modification since it was first laid down according to mental symptoms by Philippe Pinel, 1745-1826, but the following description depends on the classification adopted by the leading schools of psychiatry all the world over.

Insanity arising in infancy or early childhood is known either as *Idiocy* in the lower mental types or as *Imbecility* in the higher. This kind of insanity may or may not be accompanied by gross disease of the brain, such as hydrocephalus, and is very often associated with epileptic fits. Cretinism is a condition of underveloped intellect due to absence or atrophy of thyroid gland.

Among the insanities due to actual structural disease of the brain are general paralysis of the insane and senile dementia.

General Paralysis of the Insane is a common and always fatal disease, the causation of which is intimately connected with syphilis. Progressive feeblemindedness is the chief symptom, but this is usually accompanied by a peculiarly happy mental state in which delusions of wealth, grandeur, and omnipotence are prominent; the delusions are very extravagant and changeable. Bodily emaciation and paralysis gradually get worse along with the dementia, the speech from being slurring in the early stages becomes inarticulate, all bodily control is lost, and death usually supervenes in from one to three years. No treatment has ever cured the disease.

Senile Dementia is the insanity of old age. Loss of memory is usually the first symptom, and is followed by various degrees of weakness of mind, up to apparent absence of any mind at all. These patients are sometimes very violent and difficult to manage. Senile dementia never improves. The length of time the patient lives depends on his bodily health.

Epilepsy is very often associated with insanity of the most violent and serious kind. The main characteristics of the insane epileptic are irritability and impulsiveness. He is the most difficult of all patients to manage, and is very frequently homicidal and sometimes suicidal as well. He seldom improves, and may live for many years.

Insanity may be caused by definite bodily diseases or intoxications.

Alcoholic Insanity may take the form of *Delirium Tremens*. In this case the subject has been soaking himself in spirits to the exclusion of food. The delirium, which is characterized by mental confusion and vivid visual hallucinations of an unpleasant nature, ensues when the alcoholic stops drinking suddenly, as he must under the circumstances. The patient always recovers if properly treated, but convalescence is slow, as the stomach is always very much upset. No alcohol should be administered in treating the patient. *Chronic Alcoholism* may result in permanent impairment of intellect. *Dipsomania* is the inability to resist periodic outbursts of extremely excessive and usually solitary drinking; this type of case is much the worst from the sociological point of view, and is also commoner than is usually supposed. The subject struggles against the craving, which, however, usually gets the upper hand, as in all drug habits. The dipsomaniac is the patient who is to be found in the ordinary inebriate home.

Popular and medical opinion regard alcohol as the principal direct cause of insanity; this is a most inaccurate statement, as it is extremely rare for alcohol to produce chronic mental disease. The unstable person cannot tolerate large quantities. Alcohol, on the other hand, is a most potent factor in producing serious bodily disease, and in laying the foundation of a family tendency to nervous and mental illnesses.

Acute and Subacute Delirious Insanity comprises a very important group of conditions which are the result of nervous exhaustion plus the invasion of the brain by poisonous infections the nature of which has been determined in a few cases only. The patient is deteriorated in bodily condition, the alimentary system is usually out of gear, and there may be actual fever. The mental condition is one of confusion; the patient is not properly conscious of his surroundings, may be very restless and violent, and often has visual and other hallucinations. The result is either death or recovery, and depends almost entirely on the early provision of expert medical and nursing attention. The injudicious use of certain sedative drugs (especially chloral) has damaged the chances of many cases. Forced feeding may be necessary. Hospital treatment is essential. *Acute Puerperal Insanity* belongs to this group, and requires the same careful treatment.

The remainder of the diseases to be described may be called the mental diseases *par excellence*, as their onset is not connected with any particular change in the brain or general bodily illness. The altered personality of the subject is the first thing which draws attention to the illness.

Melancholia consists of mental depression (misery) so severe that the patient loses all sense of proportion of his trouble and ceases to behave rationally. A suicidal tendency is the most important symptom, and for this reason the patients need the most careful observation; unfortunately, however, suicide often takes place before the mental disease has been recognized. In many cases depressive delusions are present; the nature of these may vary from beliefs in financial ruin to those of eternal damnation, according to the type of person affected. The bodily health suffers, and as a rule, the patient becomes much emaciated, as a result of self-imposed starvation.

Mania consists of extreme and irrational happiness. The patients are very talkative and may be very noisy and violent. The bodily health is not very much upset. True mania is uncommon, and the term is often wrongly applied to all sorts of other conditions. Recovery occurs frequently, but in smaller percentage of cases than melancholia.

Folie Circulaire or *Alternating Insanity* is a combination of mania and melancholia in successive phases. The periods of insanity may range in duration from a few days to many months. The outlook is bad, as the disease is a constitutional mental habit.

Dementia Præcox, *Primary Dementia* and *Adolescent Insanity* are some of the names which have been applied to a large and very important group of cases. The disease begins very insidiously, usually at the age of from twenty-five to thirty-five, and is characteristized by mental reserve, stolidity, and gradual estrangement from the outside world. Vivid hallucinations of hearing are the rule, and the patient often develops strange mannerisms and fixed attitudes. The mental life of the patient ultimately

ceases to have any connection with his surroundings, and becomes a fantastic tissue of day-dreams, delusions, and hallucinations. The patients commonly live a long time, and form a large proportion of the permanent population of our menta hospitals. There is a strong family tendency to the desease.

Systematized Delusional Insanity (*Paranoia*) is a rare intellectual anomaly of which good examples are to be found in every large institution for the insane. The disease usually manifests itself after the age of thirty-five, and consists of a sense of personal superiority which at first leads the subject to believe that he is being persecuted by other persons, and so is being prevented from fulfilling the exalted destiny which is in store for him. He commonly makes himself a nuisance to his employers or to the public at large. Later on the grandiosity of the patient knows no bounds, and he will argue that the reason why he is shut up is because a royal princess wants to marry him, because he is the real cause of current political troubles, or because he is the incarnation of the Deity, and the government know how great his power might be. He is not usually a difficult patient to manage, as with all his apparently disadvantageous surroundings he can never get rid of his self-satisfaction at being so much better than other people. This is a mental disease which gradually progresses and does not affect length of life. Abortive types of this kind of insanity are common enough in everyday life.

War and Insanity.—During the World War the commonest types of insanity met with among soldiers as a result of fighting service were the delirium of exhaustion and melancholia. The recovery rate was very high.

It must be clearly understood that the term 'shell-shock' refers entirely to hysterical and neurasthenic breakdowns, which, though they should be classed as mental illnesses, are seldom so severe as to lead to insanity otherwise than in the form of transitory mental confusion.

Treatment.—Although it appears that that the anc. Egyptians and Greeks treated the insane as suffering from disease, this was succeeded by the mediæval idea that they were possessed of devils, and the treatment applied was scourging, torture, plunging afflicted persons into pools of water until they were nearly drowned, and chaining them up in dungeons. In somewhat later times the harmless insane wandered about the country or were taken care of at holy shrines, and those considered dangerous were put in chains in prisons along with criminals. Asylums where the insane were detained were built (or in some cases former monasteries, etc., were used) in the 17th and 18th centuries but the treatment was much as before More humane treatment was first advocated by Pinel and Esquirol in France at the end of the 18th cent. It was not however, until near the middle of the 19th cent. that physical restraint began to be abolished from asylums, and scientific treatment, with light work and exercise in the open air, began to be introduced.

Short attacks of delirious insanity and alcoholism and such comparatively transient states as acute puerperal insanity may be treated quite well at home under a good nurse and the supervision of a physician, but a good modern mental hospital has the advantages of a healthy and systematized régime and dietary under skilled nursing and medical supervision, and proper accommodation for violent and invalid cases. In fact, instead of the old asylums of detention with strait waistcoats and other appliances, they are nowadays mental hospitals, conducted on scientific principles Indeed, certain mild forms of insanity can well be treated in special wards of general hospitals.

The treatment consists in plenty of nourishing food—over-feeding rather than under-feeding. Cod-liver oil, malt extract, and the like are valuable in cases where nutrition is poor, and in many such cases wines and malt liquors are of distinct benefit. Quinine, iron, and dilute mineral acids are valuable tonics but nerve stimulants—*e.g.*, strychnine—require more care in administration, as they may lead to mental excitement Moderate exercise in fresh air is most important, simple open-air work, such as gardening, social amusements, dancing, etc., in moderation, help to divert patients' minds from morbid thought into more healthy channels.. *Hypnotism* is employed with benefit in the treatment of some types of insanity, particularly in cases of morbid obsession.

INSCRIPTIONS. See PALAEOGRAPHY CUNEIFORM INSCRIPTIONS ARCHAEOLOGY.

INSECTIVORA (Insect Eaters), an Mammalia of the class Rodentia, usually small in size and nocturnal in habit They may possess a smooth velvety fur as in the mole (*Talpa*), or have a covering of spiny erectible quills, as in the hedgehog (*Erinaceus*). They run partly or wholly upon the sole of the foot, and the first digits of both feet (corresponding to the human thumb and great toe respectively) are not apposable. In addition to moles and hedgehogs, the order also includes shrews, tree-shrews potamogale (an elongate animal and powerful swimmer, inhabiting the rive

banks of the W. African tropics), and galopithecus (a bat-like creature inhabiting S.W. Asia, which possesses a membranous skin-fold, the *patagium*, by means of which it is able to glide parachute-fashion from tree to tree). In nearly all, the snout is peculiarly delicate and sensitive and projects beyond the apex of the upper jaw. The teeth are characteristic, the mandible bearing more than two incisors, whilst the molars possess tuberculate roots. The milk dentition is extremely transitory, and is absorbed in the majority of cases before birth. The brain is small, the cerebrum leaving the cerebellum exposed, and being, with the exception of a lateral groove, quite smooth. The characters of the molars, and the small, smooth brain, are strongly indicative of the primitive character of the group, and this is confirmed by the absence of scrotal sac and the abdominal position of the testes. With the exception of the West African elephant-shrews, the urinogenital and anal apertures are partially or wholly enclosed in a common skin-fold suggesting a cloaca.

The order, which is not represented in Australasia, first makes its appearance in the Lower Eocene. The fossil forms are more or less synthetic in type, and suggest nearer affinities with the marsupials, the wholly extinct creodonts, and the lemurs than do their modern representatives. The I. are grouped in twelve families, of which the *Soricidæ* (shrews), *Talpidæ* (moles), and *Erinaceidæ* (hedgehogs) have Brit. representatives. The wide and often extremely limited geographical distribution of many of the families lends further support to the primitive character of the order.

INSECTIVOROUS PLANTS, besides feeding in the usual way, capture and devour insects. Varieties: (1) with leaves provided with pit-like traps filled with a viscid fluid—*e.g.*, *Drosophyllum lusitanicum* of Portugal and Morocco; (2) with no pits on leaves, but secreting a viscid fluid—*e.g.*, sundew; (3) with viscid fluid, along with a movement to capture insect—*e.g.*, Venus's fly-trap In each case the viscid fluid possesses digestive or dissolving qualities. In this way the plant obtains a supply of nitrogenous matter in circumstances where the usual means of supply may be deficient.

INSECTS belong to the invertebrate group of Arthropoda. There are over a quarter of a million species known today, and the likelihood is that the study of entomology in the future will reveal many thousands more. Thus I. are by far the largest class of animals, and can further claim a very remote ancestry, as the Lower Silurian rocks in the earliest ages known to geologists bear distinct traces of them. 'A typical I.' stands considerably higher in the biological scale than Peripatus or Myriopods. Its body is enveloped in a horny substance called chitin, and is structurally composed of three segments, which are frequently so narrowly united that the I. seems cut up into three parts—a phenomenon which has given the class its name (*insect*, Lat. for 'cut into'). These three divisions are the head, thorax, and abdomen. The adult I. has wings, with the exception of the caterpillar, etc., a centralised body with only three pairs of locomotor limbs, whence it is called a Hexapod ('six legs'), and carries on its respiration by means of air-tubes or tracheæ, whence it ranks with other Tracheata.

The classification of insects is based upon variation in structure, especially upon the various types of wings and mouth arrangements: (1) 'Aptera' (wingless, sugar-lice and springtails. There is no metamorphosis; (2) 'Neuroptera' (nerve-winged), May-flies, caddis-flies, scorpion-flies, and dragon-flies, white ants, and book-lice. These have four glassy and membraneous wings, a complete metamorphosis, and a mouth of the biting type; (3) 'Lepidoptera' (scale-winged), butterflies and moths. These have four wings with delicate, colored scales and a complete metamorphosis. The mouth is furnished with a proboscis, and the larvæ are characteristic; (4) 'Orthoptera' (straight-winged): earwig, cockroack, locust, grasshopper, and cricket. These are 'ametabola,' have 'cerci' appended to the abdomen, and have the front pair of wings leathery and smaller than the back wings; (5) 'Hymenoptera' (membrane-winged): wasps, bees, and ants. Their mouths are both biting and suctorial. They have four transparent, membranous wings, and undergo a remarkable transformation; (6) 'Diptera' or 'Flies' (two-winged): house-fly, horse-fly, and bluebottle-fly, gnat, daddy-longlegs, and mosquito. Their metamorphosis is very complete, their mouths are mostly suctorial, their two wings are transparent and membranous and their larvæ are both legless and headless (maggots); (7) 'Hemiptera' (half-winged): aphis (green-fly), cochineal insect, water-boatman, lice, bugs, and cicada. These undergo slight metamorphosis and have suctorial mouths, and four wings, which is either membranous or horny with a membranous apex; (8) 'Coleoptera' (sheath-winged): water-beetle, stag-beetle, and tiger-beetle, etc., glow-worm, and cock-chafer. Members of this class experience a complete transformation and have biting

mouths, but their salient characteristic is the horny sheath ('elytra') of which their front or upper wings are composed, so that the delicate membrane of the hind or lower pair is quite hidden from view.

Life and General Characteristics.—I. have most diverse haunts and frequent underground cased, hot springs, and even the sea; nevertheless, the majority are aerial and dwellers on land. In tropical and temperate climates they abound, but they are represented even in the polar regions. Many, as, for instance, the pond-skater, whirligig beetle, water-scorpion, and gnat, are aquatic for the earlier days of their lives. Generally speaking, adult I. are short-lived and die within a twelvemonth; the adult Ephemerid, as its name implies, does not live beyond twenty-four hours, but the queen bee flourishes for some years, and a queen ant will rarely last for thirteen. The food of insects is very various. Some steal the pollen and nectar from the flowers; others feed on weaker species of their own kind; others act as internal or external parasites of higher animals; others again grow fat on putrescent matter, and yet another section suck juices from living organisms. Parents will often gather a store to feed their young, even though they themselves die before the larvæ are hatched. A number of I. are able to express sorrow, anger, or fear, or to convey information or make love by means of sound. This may be produced by the rubbing together of the rough surfaces of the outer cuticle, or by the buzzing vibrations of leaf-like appendages near the stigmata of the air-tubes, or by the quick flutter of their wings. Thus grasshoppers scrape their legs against their wing ribs and male crickets chirp by rubbing their wing-cases together. Many Hymenoptera produce their noise by the second means, whilst the whirring sound of bees and flies is due to wing motion. The death's head moth emits a noise by blowing air out of its mouth. Sometimes the noise is purely automatic. If left unchecked I. would multiply with an alarming rapidity. Fortunately, however, inclement weather, and the predilection which birds, ant-eaters, frogs, and fishes, show for them as food, counteracts their amazing fecundity. As with higher animals, so certain I. are naturally protected by having an outward appearance which exactly counterfeits their actual surroundings. This is the case with moss and leaf I. and with humming-bird moths. Other I. are saved from molestation by disgusting fluid discharges, an unpleasant smell, a hard skin, or an offensive weapon like a sting. The social species, ants, bees, termites, and wasps, offer a most instructive and fascinating field for study by reason of their intelligence, architectural skill, and developed communistic life.

Economic Value.—Unconsciously I. play a great part in the cross-fertilisation of flowers as they carry pollen from one bloom to another. The 'myrmecophilous' (ant-loving) plants are actually guarded by ants from other and hostile intruders. Man owes a debt of gratitude to the hive-bee for its honey and wax, to the silk moth for its silk, and to the cochineal I. for a dye. But there are many species which seem purely harmful and destructive. Cattle, sheep, and horses are annoyed by the bot-fly; crops, orchards, and vines are a prey to a whole army of greedy parasitic I., and the havoc caused by a locust swarm is often untold. House flies are strongly suspected as the agents which carry pathological or disease-bearing germs in a number of infectious outbreaks; the mosquito is probably largely responsible for the horrible disease called *Elephantiasis arabum.*

INSECTS, COTTON. See COTTON INSECTS.

INSOMNIA, inability to sleep. which is usually accompanied by emaciation, dryness of the skin, and nervous disturbances, may be due to anæmia or hyperæmia of the brain, secondary to diseases of the heart, lungs, and other organs; while the abnormal state of the blood in gout, rheumatism, etc., or through excessive use of tobacco or alcohol, will also produce insomnia. It may be due also to overwork, or nervous derangements, neurasthenia, etc., from various causes. The treatment depends on the cause, which, if possible, should be removed by suitable remedies; and various drugs—potassium bromide, chloral hydrate, belladonna, opium—when administered under the direction of a doctor, are valuable.

INSPECTOR GENERAL, the head of a department in the U. S. Army. The duty of the Inspector General and his staff is to make periodical inspections of the army and all its institutions, including even the homes for disabled veterans, and to keep the Secretary of War constantly informed regarding such matters as equipment, stores, armament, disposition of garrisons, personnel, etc. It is also his duty to suggest improvements, such as the adoption of new types of artillery, small arms, etc., and to suggest remedies where he is obliged to report certain defects. In 1923, the Inspector General of the United States was Major-General Eli A. Helmick, of Indiana.

INSPIRATION (Lat. 'inbreathing').—The idea that a human being can be an organ or vehicle for the manifestation of the divine, or can receive divine communications, appears in all religions. Often the inspired person is in a state of great emotional excitement. The Old Testament prophet was at first a seer, then moral, spiritual, and to some extent predictive. I. is most frequently used in connection with sacred writings; all great religions have their sacred books; in Muhammadanism the conception of I. of the Koran is more rigid than that of the Bible has ever been among the Ians. In the Christian Church the literal and verbal inerrancy of Scripture has been largely believed in, but it is now generally abandoned. Another view is that the Bible is infallible in matters of faith and morals, though not always necessarily in others. Most Christian theologians would now accept the Bible as spiritually more inspired than any other book, and as containing all things necessary to salvation, but would admit moral and spiritual progress.

INSTERBURG (54° 37′ N., 21° 50′ E.), town, E. Prussia, Germany; iron foundries, tanneries. Pop. 35,000.

INSTINCT, a word used in a vague and popular and also in a more exact scientific sense, in which it is defined as meaning those mental faculties which are for a specific end, but which do not necessarily imply conscious knowledge on the part of the creature who exercises them. Some would try to separate the biological and psychological aspects of instinct among animals, but it is in the connection of the two that the problem really consists. The term 'habit' is applied to dispositions and secondary automatic actions acquired after birth. Intelligence presupposes individual experience with conscious purpose; the activities of instinct are performed without previous experience and without conscious purpose other than the satisfaction of response to the immediate and appropriate stimulus. The instincts of animals popularly so-called are only partly instincts proper, and partly what they have acquired. Many instinctive actions, again, as due to imitation. The problem of instinct is closely connected with heredity. There is undoubtedly such a thing as racial preparation, and the capacity for certain actions is inherited. As animals rise in the scale their instincts become more and more associated with intelligence, until in the highest animals instinct tends to lapse and intelligence to predominate.

INSTITUTE (Lat. *instituere*, to establish, appoint), name given to laws and commentaries thereon (see JUSTINIAN); to places in which training is given, or to associations for scientific purposes. The *Institut de France* (established 1795, comprises the five Academies.

INSTITUTE OF FRANCE. See ACADEMY.

INSTITUTIONAL CHURCH, one which makes social activities besides worship important in Church life (some think to the exclusion of religion).

INSTITUTE FOR MEDICAL RESEARCH, ROCKEFELLER. See ROCKEFELLER FOUNDATION.

INSTRUMENT OF GOVERNMENT, a paper constitution drawn up in Dec., 1653, by officers of the army, making Cromwell Protector under control of Council of State and a reformed Lower House; Cromwell ruled under it till 1657, when it was superseded by the *Humble Petition and Advice*.

INSTRUMENTATION is virtually synonymous with ORCHESTRATION, and signifies the distribution of parts of a musical composition among the various instruments of the orchestra. The history and development of I. run parallel, as it were, to the history and development of the orchestra. Up to the XVIII. cent. the orchestra served almost exclusively as an accompaniment to vocal music (opera, choral, etc.). Within these limitations, however, marked progress was made in the art of I. by Scarlatti, Bach, and Händel. With Gluck the orchestra and orchestration attained more importance in opera, while Haydn laid foundation of symphonic music. In Mozart's day the orchestra was still small (about forty instruments), and brass and percussion parts were insignificant, almost artificial. Beethoven gave a greater share to brasses and drums, and improved the rôle of almost every instrument. XIX. cent. inventions led to an enormous advance in tone, compass, and flexibility of winds in particular. New instruments were introduced and the orchestra was considerably enlarged. The art and science of I. naturally became more complex as the orchestra's capabilities increased. Wagner first fully realised the dramatic power of orchestral music, and by applying new laws and original ideas to the improved instruments of his day, attained effects never previously attempted or possible. Tchaikovsky and the Russ. school gave even greater prominence to brass and percussion instruments, and imparted new coloring to orchestral music. The modern masters, Strauss and Debussy, strive after emotional effects which add

lstil further to the difficulties and complexities of I.

INSUBRES, Celtic people who crossed the Alps and founded Milan, 396 B.C.; crushed by Romans, 222 B.C.; last rising defeated, 194 B.C.

INSULIN. See DIABETES.

INSURANCE.—The enormous growth of insurance and fraternal companies and the wide field of their operations, bear eloquent testimony to the profits that may be derived from taking risks. The liability such risks entail is more or less closely determined by a careful study of the law of averages and the theory of probability as applied to human mortality, business conditions and all manner of circumstances that may cause personal or property losses. Taking life insurance alone, American companies, in 1921, had 71,760,000 policies (ordinary life and industrial), representing an amount insured of $44,384,658,000. Of the 71,760,000 polices, 54,097,000 were those of companies who underwrite industrial or workers' insurance, and represented $8,006,120,000. These industrial policies produced a premium income of $283,148,000, entailed claim payments of $69,173,000, as well as payments to policyholders in addition of $95,180,000, and the companies had a reserve over 1920 of $121,826,000. In the latter year the life insurance companies paid to policyholders $744,649,000, and had a surplus of $330,688,000. Fire and marine insurance companies, in 1920, had a total income of $1,102,788,799, and paid $505,260,378 to policyholders, either as losses (the major part) or as money returned as profits or excess payments. In the same year 336 fraternal orders underwrote $1,117,970,840, in insuring their members; had 8,439,097 certificates, or policies, in force at the close of the year, representing $8,879,451,774, and paid out $109,594,855 in claims. Accident and health companies received, in 1920, $79,180,592 in premiums, and paid out $33,540,972 in losses. The premiums received by liability insurance companies amounted to $88,827,353, and $31,617,317 was paid out in losses. Casualty, surety and miscellaneous companies, numbering 189 in 1920, had a net surplus over capital and liabilities of $92,860,639, and income of $489,774,245, of which $451,112,821 was received as premiums, and paid $196.360,067 to policyholders. Finally, 109 mutual, accident and sick benefit associations, with 1,853,328 certificates, or policies in force, received premiums or assessments of $19,537,920, and paid $10,580,188 in claims. All tell the same story of financial strength, an income far exceeding outgo, and ample reserves.

An insurance contract between two parties, expressed by a policy and sustained by the periodical payment of given sums known as premiums, obligates one party (the insurer or underwriter) to protect the other (the insured) against losses to which the insured's health, business, or property may be subject. Personal insurance covers sickness, accident, old age, maternity, risks of travelling, and unemployment. Property insurance takes a multitude of forms. Grest underwriting bodies, like Lloyds of London and American marine insurance corporations protect shipowners against loss of their craft and cargoes at sea. Equal protection is available against losses from destruction of property by fire, bad weather, or other causes on land. The farmer insures his livestock to offset losses from disease, and his crops from the unforseeable risks of climate, such as unpropitious frosts. The breaking of plate-glass windows can be insured, so can the risks of loss of or damage to automobiles. There is also burglary insurance, protection from damage by steam boiler explosions, and from elevator and vehicular accidents. Employes, such as railroad, construction and manufacturing companies, protect their resources against claims for damages arising from accidents to their workmen, while employees guard against loss of income, due to lack of work, by taking out unemployment insurance. Industrial, or working-class insurance, mentioned above, differs from ordinary life insurance in that the premiums are payable weekly in small sums, some as low as five cents, instead of in larger sums at longer periods, and covers the lives of workers from the ages of one year to 65 years with no sex distinction. Another invaluable form of insurance is that which safeguards firms from losses due to bad debts, known as credit insurance. Yet another business protection is provided by surety or bond companies, who insure employers against thefts committed by dishonest subordinates.

Governments have been drawn into the insurance system in competition with private companies. England insures her post office employees. New Zealand conducts a successful life insurance department, though without offering any marked advantages above those of private companies. Old Germany devised a compulsory insurance system for workmen to counteract Socialistic antagonism to the monarchy. In the World War the United States successfully established an insurance bureau for men who were injured, incapacitated or died, as a result of military service.

There is little government regulation of insurance companies in England, but

in the United States such supervision is quite extensive, each State regulating the business within its own borders as it sees fit. The control of insurance has been reserved to the individual States by a Supreme Court ruling which held that the conduct of insurance was not interstate commerce, and therefor not subject to federal regulation.

INTAGLIO, representation of an object made by cutting away the object from the ground, not, as in relief, cutting away the ground from the object.

INTELLIGENCE IN ANIMALS.—I. has been defined as the 'conscious adaptation of means to ends.' It is closely connected as regards animals with instinct. Romanes asserted and Mivart denied that animals possess I. and reason. But a distinction is drawn by psychologists between perceptual and conceptual thought, the former involving the perception of some relation between two things, the other abstract analysis. Much human and, at any rate, most animal thought is 'perceptual,' but it is still an open question whether animals are capable of 'conceptual' thought as human beings undoubtedly are.

INTELLIGENCE TESTS.—For many years psychologists have sought to devise tests whereby human intelligence could be measured and compared with some definite standard. Intelligence has been defined as the ability to solve problems presented to sense, and care must be taken not to confuse intelligence with knowledge. While the intelligence of a child increases with its age, and while in many cases this growth of intelligence may continue into years of adulthood and may be, and probably is, fostered by education, yet it is perfectly possible for a poorly educated person to possess more innate intelligence than one highly educated. In 1905, Binet and Simon, French psychologists, published the first series of tests for measuring intelligence. In 1908 they published a second series, and in later years the tests have been modified and improved by other scientists. The tests were designed for determining the degree of intelligence possessed by children of different ages. By experimentation, a normal standard for each age was determined, and a child was fied as to his normality or abnormality according to his ability to pass the tests for his age, or for ages less or greater than his own. There were fifty-six tests in the 1908 series, and they were designed to cover the ages between three and twelve years. Recently, however, intelligence tests have been much used to classify adults. During the war, one-and-a-half million men in the U.S. Army were subjected to these tests and classified. Two typed of tests were employed, one based on the Binet-Simon method, the other on a so-called 'point scale,' designed by R. M. Yerkes, J W. Bridges, and R. S. Hard wick. The ability to pass these tests does not depend, in any way, upon the degree of learning. Simple tasks are given the examinee, and simple problems are given him to solve. For instance, he is required to make, or complete, simple patterns, to complete sentences, or to point out errors in simple statements. Intelligence tests are being used more and more in place or ordinary entrance examinations to colleges and universities. Questions in these tests necessarily tax the intelligence more than in those designed for children or uneducated adults. An example may be given in the following question recently used in a college examination' 'If you found a Roman coin dated 55 B.C., in whose reign would you conclude that it was made?' The correct answer, of course, is that the Romans had no knowledge of the date of Christ's birth before he was born and therefore could not have dated their coins 55 B.C. A coin with such a date, therefore, must clearly be fraudulent, and the date would be no indication as to when it was made. It will be seen that no knowledge of Roman history is required for such an answer. The question tests the ability of the examinee to think clearly and quickly. Adults who show the mentality of a child are called morons.

INTENDANTS, officials of Fr. kings, before Revolution. *Intendants des finances* were under controller-general of finances. *Intendants des provinces* from about 1570 had considerable authority in provinces; they came in collision with provincials gov's and with parliaments over administration; very powerful in XVIII. cent.

INTENSIVE AGRICULTURE. See AGRICULTURE.

INTENT, element of purpose which, with attempt at offense, constitutes legal crime; the I. is an important question in criminal, but is not considered in civil matters. Many legal documents have saving clause, by which the verbal expression is to be interpreted 'according to the true I. and meaning of these presents.'

INTERCALARY DAYS, days inserted in the calendar to restore correspondence of solar and civil year; this is secured by leap-year system.

INTERCHURCH WORLD MOVEMENT, an organization founded by a number of broad minded clergymen and

laymen of the Protestant denominations for the purpose of creating a vital institution of the Church. The effort came with the momentum engendered among the churches by war service, during which the various denominations had cooperated so effectively that it was felt that this spirit might be brought to survive into the peace period. A large number of wealthy Americans became so enthusiastic over the idea that the organization took on huge proportions, a large building being required to house the various offices. Among the many projects planned by the officers was that of investigating industrial conditions, with the object of suggesting measures leading to the amelioriation of the poverty of the working classes. One of these investigations, known as the 'Pittsburgh Survey,' which was conducted during 1919-20, resulted in a report so radical in spirit that the majority of the wealthy patrons of the organization were incensed, the report more than indicating that the employees of the steel corporations were sorely oppressed by their employers. With the withdrawal of this financial support the organization disintegrated, its affairs being wound up in 1922.

INTERCOLUMNIATION, spacing of columns in classical architecture, differing in different orders.

INTERDICT, forbidding of divine worship and administration of sacraments by ecclesiastical authority as punishment for sin; pronounced by Pope against persons or countries.

INTEREST, an allowance made for the use of borrowed money or capital. The ratio which the I. bears to the loan or principal per annum is the rate per cent. I. is payable periodically, usually half-yearly in commercial transactions, but frequently monthly in the case of loans by registered moneylenders or by persons who ought to be so registered. I. is either simple or compound, the former being payable on the principal alone, the latter on the amount of the principal and interest as and when it fall due. The exaction of I. was prohibited in England as early as 1197, and the prohibition rested, as elsewhere, upon religious grounds.

It is an economic commonplace that the rate of I. is the same in all trades in the same country and at the same time—a law which rests for its validity on the elimination from profits, of compensation for risk, of dishonorable reputation and everything but pure I. on capital. But the risk in some occupations being greater, and some trades requiring more superintendence than others, there must always be differences in the rate of I. or profits in different trades at the same time; and in those trades or businesses in which the rate is higher than the bank rates—their criterion of the average rate—some economists contradistinguish such higher rate by the name *false I.* It is an accepted position in economics that as wealth and population increase the rate of I. declines, because, among other causes, wealthy and populous communities afford less and less scope for any given quantity of labor and capital, a tendency which is the root principle of the Ricardian theory of rent; and again the increasing export of capital tends to produce a uniform rate for all countries.

INTERGRAPH. See CALCULATING MACHINES.

INTERIM (Lat. meanwhile), name given to temporary settlements of controversial points during the Refromation, by order of the emperor, to remain in force until a general council should meet-noted I's are those of Ratisbon (or Regensburg), 1541. Augsburg and Leipzig, 1548.

INTERLAKEN (46° 42′ N., 7° 52′ E.), town, Swiss canton of Berne, on Aar, between lakes Thum and Brienz; tourist centre. Pop. 3,000.

INTERLUDE (Lat. *inter,* between, *ludus,* play), a short piece or musical phrase performed between the acts of a play or between the verses of a hymn. In drama, a short performance given between the parts of a play or in the intervals of a banquet or court pageant.

INTERNAL IMPROVEMENTS. — The question of improving roads, waterways, and harbors, of the United States was discussed by Congress in the early days of the Republic, but there were so many other more pressing matters to decide in organizing the new government that many years passed before anything important was done. In 1806, the Federal government built a wagon road from the Potomac to the Ohio river, which was carried to Wheeling in 1820, and then to Columbus, Indianapolis, and St. Louis. The first canals mentioned in early history were built in Pennsylvania, in 1790-1810. In Maryland, in 1784. The Erie Canal (*q.v.*) was built in 1823, by New York State, to the Genessee River, and was connected with Lake Erie in 1825. The first mile of railroad was built by the Baltimore & Ohio, in 1828, followed by the Charleston & Hamburg, 1829, and the Mohawk and Hudson, 1830. The first efforts of the Federal government to improve the waterways of the country are not recorded, but in 1922 there were

26,410 miles of navigable streams in the United States. The River and Harbor Bill of March, 1921, appropriated $15,000,000 under the direction of the Secretary of War, for 1923-1924, for projects, etc. and later in the year the President and Director of the Budget asked for $27,885,260, for present works, their maintenance, etc. The Chief Engineer of the U.S.A. in his report to the Secretary of War, in 1922, recommended $43,000,000 appropriation for the year, exclusive of the Muscle Shoals, Alabama, project. By the Federal Aid Act of 1916 to 1921, 28,135 miles of highways were under Federal Aid at a cost of half a billion dollars, of which the government supplied 40 per cent. The Federal Act of November 9, 1921, appropriated $75,000,000 for roads to states contributing dollar for dollar exclusively from state treasuries.

INTERNAL REVENUE. — Funds raised for government purposes in the United States by the imposition of taxes upon domestic products or activities, as distinguished from customs duties on goods imported from abroad. The system dates back to the very foundation of our government, have been inaugurated by the first Secretary of the Treasury, Alexander Hamilton. The Government had assumed debts incurred by the States in the Revolutionary struggle, which they themselves were unable to meet. To discharge these obligations, for which the customs were inadequate, Hamilton proposed a tax on distilled spirits. Against the most bitter opposition he secured Congressional approbation of a measure, 1791, imposing a tax on this product of from 11 to 30 cents a gallon, according to its alchoholic content. So vigorously was this tax fought by the liquor interests that the opposition finally resulted in the so-called Whiskey Rebellion. This was summarily repressed, and the right of the Federal Government to impose such a tax was firmly established. Once the principle was accepted, it had unlimited applications. Snuff and sugar were taxed; government stamps were required to be affixed to deeds, legal documents and negotiable instruments. The laws were repealed in 1802, when the Federalists were ousted from power, but reimposed with many additions during the war of 1812, to meet the pressing necessities of the Government. Following the conflict, they were again repealed, and from that time to the outbreak of the Civil War, government revenue was derived from the customs. In 1862 the office of the Commissioner of Internal Revenue was created with an organization of inspectors and collectors forming a system which has remained in force up to the present time. During the Civil War, not only liquors and tobacco, but almost eveyr conceivable object had to bear its share of taxes for the financing of the conflict. Most of these were distinctly war taxes and were repealed by 1870. Whiskey, beer, tobacco and stamp taxes were still retained. To these has now been added the income tax, the greatest revenue producer of all.

The Internal Revenue System is pliable and elastic. Taxes can be raised or lowered, imposed or repealed, as the exigencies of the government require or permit. The cost of administration is only about two and one-quarter per cent of the amount collected. The Internal Revenue receipts for 1922 were $3,197,451,083, as contrasted with customs receipts for the same period of $356,443,387.

INTERNATIONAL, THE, an international association of working men, founded 1864, in London; came to an end at Philadelphia, in 1876; most important members were Karl Marx and Bakunin, leaders respectively of moderate and extreme factions. See SOCIALISM.

INTERNATIONAL CONFERENCES, AMERICAN. See INTERNATIONAL AMERICAN CONFERENCES.

INTERNATIONAL LANGUAGE. See UNIVERSAL LANGUAGE.

INTERNATIONAL LAW (also called *jus inter gentes*, or erroneously *jus gentium*), the usages observed in relations between civilized states. International law may be divided into the Natural and the Conventional elements. The former, generally known as the *Law of Nature*, is based on those principles which are supposed to be universally accepted as rules of conduct for both states and individuals in their dealings with each other; it is thus a moral rather than a legal obligation. The Conventional element is the result of obligations imposed upon states by treaties and agreements between themselves, and of precedents and cases whereby the customary practice has been established. In many European states the writings of lawyers on the subject are also regarded as law. The chief question which has to be decided is that of the lawfulness or unlawfulness of war; and to prevent war the states may refer their disputes to international arbitration. Up to the World War this practice was becoming increasingly common, and several nations had made it obligatory *inter se* by treaty.

The state as the unit of international law has certain rights which other states

must recognize. These include: (1) the right to do whatever is necessary for its own conservation; (2) the right to acquire new dominions; (3) to buy or sell property; (4) to choose its own form of government or to change it; (5) to increase its army and navy and to develop its commerce. And among the obligations morally binding on states are: (1) to allow no plots against sovereign of a foreign state to be organized within its bounds; (2) to put down sedition; (3) to protect its subjects in foreign countries; (4) to see that justice is impartially administered. In arbitration treaties issues affecting the 'vital interests' of the contracting parties are usually excluded from the application of that method of settlement, interference with a nation's rights or independence being regarded as a legitimate *casus belli*. In international law the sea beyond the three-mile limit is regarded as free to all, every nation having rights of navigation and fishing on the high seas. Only ships of war and merchant vessels are recognized in international law; the former are armed vessels used in public service; they are considered to be part of the national territory of the state to which they belong, and when entering the ports of foreign states are not subject to the local jurisdiction of these states. Merchant vessels, on the other hand, are subject to the laws of any foreign state whose ports they may enter. Pirate vessels are not recognized and may be seized; and by most states ships engaged in slave trade are treated as pirates. In 1899 the International Peace Conference met at the Hague, and arranged for the constitution of a permanent arbitration court, to which disputes between states might be referred. In August, 1913, the Palace of Peace, instituted by the 'Carnegie Foundation' at the Hague, was inaugurated, and a year later Europe was engaged in the most widespread and sanguinary war of the ages.

International law differs from ordinary law in two respects: (1) it is not made by any legislative authority; (2) it cannot be enforced by any superior power. In all international disputes the final tribunal is war or arbitarion. The utter breakdown of international law during the World War revealed its weakness in the most glaring manner, and led to the constitution of a League of Nations, which should promote international cooperation and achieve international peace and security by the acceptance of obligations not to resort to war, and by the firm establishment of the understandings of international law as the actual rule of conduct among governments. See under LEAGUE OF NATIONS.

INTERIOR, DEPT. OF. See CABINET.

INTERMITTENT FEVER. See MALARIA.

INTERPELLATION, term in legislative procedure for interruption, with the consent of the Assembly, of ministerial business, by question attacking ministerial policy; sometimes weapon of obstruction.

INTERREGNUM, period between death of king and election of successor; in Middle Ages this often meant lapse of government.

INTERREX (Lat. *inter.*, between; *rex*, king), official app. by Rom. senate on death of a king to govern until appointment of new king (period called an *interregnum*), sometimes ten *interreges* were elected with duty of choosing a king. Under the republic an inter-consular 'I.' was sometimes appointed.

INTERSTATE COMMERCE, connotes the free and untrammelled conduct of trade between persons throughout United States, irrespective of State lines. The term has its chief significance in its opposite relation to Intrastate Commerce, which expresses trade transactions carried on within the boundaries of a State. Interstate commerce is under Federal control; intrastate commerce is regulated by each State. The phrase has come to mean largely the transportation of commodities over the great systems of railroads that pierce the country unimpeded by State boundaries. In other words, the railroads, as a national means of transit, came to dominate interstate commerce. Interstate railroad traffic and interstate commerce accordingly pass current as interchangeable terms, though the jurisdiction of the Interstate Commerce Commission (the Federal body that controls the railroads) also embraces the supervision of water-borne traffic when connected with a railroad, the regulation of interstate pip (oil) lines, as well as of telegraphs, telephones, and cables. A trade in commodities and transport thereof, originating and completed within a State is intrastate commerce, subject to State, not Federal, regulation; but a transaction that calls for transshipment of the goods from one State to another becomes interstate commerce, since delivery necessitates the use of transit facilities that operate in more than one State.

The control of interstate commerce in its intimate connection with railroad traffic became imperative following the great expansion of railroads after the Civil War. Interstate commerce, as such, could take care of itself; but the railroads, plunging past State lines and

scorning State control, ran wild in their liberty, like overgrown, refactory children. Competition was stifled by pools, rate discriminations became a scandal, favored shippers were enriched by the ruin of business rivals, and the development of towns and localities were at the mercy of lines which dictated whether a community should or should not have transportation. Most of the traffic lay wholly outside State control.

The Interstate Commerce Commission was created by Congress, in 1887, to remedy the evils arising from the unregulated and unscrupulous operation of railroads between the States. It set out to obtain just transportation charges, check discrimination favoring one shipper at the expense of his competitor, and prevent the pooling of freights. Following this measure came the Sherman Anti-trust Law, 1890, which further regulated the transit of interstate commerce by defining as illegal all combinations that throttled competition and were thus in restraint of trade or commerce between the States. Under this law the mergers of the Northern Pacific and Great Northern, 1903, and of the Union Pacific and Southern Pacific, railroad systems were dissolved by the U.S. Supreme Court. The original law establishing the Commission was amplified by other measures, strengthening that body's powers, such as giving it authority to fix railroad rates and preventing the granting of illegal rebates. The rates established by the Commission are unappealable unless contested on constitutional grounds. See RAILROADS.

INTERSTATE COMMERCE COMMISSION, a body of seven members, formed to administer the Interstate Commerce laws, the first of which was passed by Congress in February, 1887, as a result of the agitation against the practice of the railroads in favoring certain shippers. Since then the jurisdiction and the powers of the Commission have been frequently broadened by amendments. Generally speaking, its function is to regulate the control of the railroads of the country in the public interest, especially in the matter of passenger and freight rates, which may not be changed without its consent. Carriers are compelled to report to it annually and whenever demanded for special reasons. It has the power to examine the books of all carriers. It has the power to compel testimony, in which regard it enjoys the same status as a Federal court. It also has the power to enforce whatever labor laws may be passed for the protection of employees, etc. In 1923, the chairman of the Commission was Charles C. McChord.

INTERVAL, in music, is the difference in pitch between two sounds; the ratio between the frequencies (vebrations) of two notes. Intervals are reckoned from the lower note upwards, both notes being included. They are classed according to the number of degrees of the stave—*i.e.*, alphabetical letters—included, not according to number of tones or semi-tones contained. Intervals are subdivided into different classes, according to number of semi-tones contained: fourths, fifths, and octaves are called perfect; seconds, thirds, sixths, and sevenths are called major and minor. A diminished interval is one that contains a semi-tone less than a perfect or a minor interval, while an augmented interval contains a semi-tone more than a perfect or a major interval.

INTERVALE, term used geographically in America for low-lying land between hills.

INTESTACY.—In the case of persons dying without making a will (*i.e.* intestate).

INTESTINE, the lower part of the alimentary canal, divided in man into small and large intestines, communicating by the ileo-cæcal valve. See DIGESTION.

Intestinal Obstruction may be *acute*, caused by strangulation by bands or adhesions, by volvulus or rotation of the intestine on its own axis so as to produce strangulation, by acute intussusception or the telescoping of one portion of the intestine into the part below, by the termination of chronic obstruction, by kinking or through peritonitis; or the obstruction may be *chronic*, due to impaction of fæces or foreign bodies, to stricture, tumors, and other affections of the intestinal wall, or to compression of the intestine from tumors or adhesions without. The symptoms of the former are sudden severe pain, later becoming continuous, in the region of the umbilicus, shock and collapse. There is persistent vomiting, which soon becomes very offensive, the bowels do not move, the abdomen becomes distended, and peritonitis comes on if the obstruction is not relieved by immediate operation. In regard to chronic obstruction, there are colicky pains, with constipation alternating with diarrhœa, and finally acute obstruction takes place. The treatment before the case becomes acute is a fluid diet, enemata, and small doses of cascara or calomel. Operative treatment is generally carried out at an early stage.

INTOXICATION, poisoning by drugs or other poisonous substances; used chiefly as denoting the condition pro-

duced by excessive consumption of alcohol.

INTRANSIGEANTS (irreconcilables), political party uncomprisingly hostile to an existing government, the term being used chiefly in Spain, 1873, France, and Italy.

INTUITION, a philosophical term for that which is directly perceived or apprehended, whether in logic or ethics, as opposed to that arrived at by a reasoning process.

INVALIDES, HOTEL DES. See PARIS.

INVENTORY, BENEFIT OF (Lat. *beneficium inventarii*), term in Rom. and Common law for right of heir to enter into estate without being liable for encumbrances beyond its value as inventoried.

INVERARAY (54° 14′ N.; 5° 4′ W.), seaport, county town, Argyllshire, Scotland, on Loch Fyne; herring fishery. I. Castle, built 1744-61, is seat of Duke of Argyll.

INVERCARGILL (46° 26′ S., 168° 23′ E.), town, Otago, South Island, New Zealand, on New River estuary; breweries, foundries; exports, preserved meat, wool, and timber. Pop. 12,000.

INVERNESS (57° 28′ N., 4° 13′ W.), royal burgh, seaport, and county town, Inverness-shore, Scotland, on Ness; tweed centre; 'Capital of Highlands'; near end of Caledonian Canal; has coasting trade; woolen industries, breweries, distilleries. I. was ancient Pictish capital; has remains of castle built by Cromwell and destroyed by Jacobites, in 1746; scene of 'Northern Meeting'; has Episcopal cathedral; famed for purity of Eng. accent. Pop. 20,000.

INVERNESS-SHIRE (57° N.; 4° 40′ W.), Highland county, Scotland, extending from Moray Firth on E. to Atlantic and Outer Hebrides on W.; area, c. 4,200 sq. miles; county town, Inverness. Surface is mostly wooded country, rough hill-grazing, heath, peat, and stony waste little cultivated; deer-forests and grouse-moors; excellent fishing; many wild glens. I. is largest and most mountainous county in Scotland; flat strip near Inverness gradually rises into mountainland, culminating in Ben Nevis, 4,406 ft., in S.W., highest point in Brit. Isles. There are many rivers, the largest being Spey, Ness, Beauly, and Lochy. Among the numerous lochs are Ness, Morar (deepest in Brit. Isles), Shiel, Archaig, Lochy, Ericht, and Laggan. Caledonian Canal traverses I. A geological 'fault' runs across Scotland through I.; slight earthquake shocks frequent; interesting signs of glaciation. Pop., 1921, 82,446.

INVESTITURE. — In feudal times some token of I. was commonly given when a man was installed in lands or office. Many of the bp's and abbots held land under the Crown from the days of Charlemagne and were invested with ring and crozier on appointment to their sees. This soon was plainly objectionable, for simony and other abuses became common. The Lateran Synod of 1559 forbade clerical I. by a layman, and papal prohibitions followed in 1078, 1080, 1087, 1089. The final prohibition came from the Lateran Council of 1123. In England the struggle over I. was between Abp. Anselm and Henry I.

INVOLUTION, in math's the raising of a quantity to a given power, *e.g.* $4^2 = 16$. *Evolution*, the extracting of roots (*e.g.* $\sqrt{16+4}$) is included with I. under *Theory of indices*. See ALGEBRA.

IO.—(1) legendary dau. of Inachus, king of Argos; beloved by Zeus, who, to save her from Hera, changed her into white heifer; Hera sent to Argus to guard her, but Hermes slew him; eventually was restored to human form. (2) (Astron.) an asteroid, and also a satellite of Jupiter.

IODINE (I. At. Wt. 126·8), non-metallic element with bluish-black metallic luster; S.G. 4·95, M.P. 115° C., B.P. 200° C. Formerly it was manufactured from *kelp*, a species of seaweed, but it is now worked up from the salts of which large natural deposits exist. In presence of potassium iodide, I. dissolves in water, forming a brown solution. It forms a brown solution in alcohol and in ether, and a violet solution in carbon disulphide and in chloroform. With starch I. gives an intense blue coloration. I. is present in the thyroid gland, and from the earliest times bodies containing I. have been much prized medicinally. There are two series of salts, *Iodides* and *Iodates*, and two acids, *Hydriodic Acid* (HI) and *Iodic Acid* (HIO_3). Of the *Halogens*, I. has the least affinity for other elements.

IODOFORM, CHI_3, yellow cry stalline substance with strong smell; antiseptic and disinfectant; much used in surgery.

IOLA, a city of Kansas, in Allen co., of which it is the county seat. It is on the Kansas and Texas, the Missouri Pacific, and the Atchison, Topeka and Santa Fe railroads, and on the Neosho River. In the neighborhood are extensive natural gas wells which are utilized for industrial purposes. The industries

include a zinc smelter, cement works, foundry, and machine shops. The public buildings include a public library and a hospital. Pop., 1920, 8,513.

ION, OF CHIOS (*d.* 421 B.C.), Gk. poet and historian; won prize for tragedy at Athens.

IONA, ICOLMKILL (56° 19′ N., 6° 29′ W.), island, at S.W. corner of Mull, Inner Hebrides, Scotland; about 3½ miles long and 1½ miles wide; area, *c.* 2,000 acres; scarcely half cultivated; coast rocky and surface mostly rough. I's chief interest lies in association with St. Columba (*q.v.*) and introduction of Christianity into Scotland; great center of learning and religion, VI. cent. onwards; frequently ravaged by Norsemen; abounds in hist. antiquities; ruins of ancient nunnery, monastery, and chapels; also restored ruins of cathedral, with choir, sacristy, transepts, and a 70-ft. tower, as well as Columba's tomb and numerous crosses and carved stones. Pop. 200.

IONIA, a city of Michigan, in Ionia co., of which it is the county seat. It is on the Pere Marquette and the Grand Trunk railroads, and on the Grand River, 35 miles E. of Grand Rapids. It has many important industries, including the manufacture of paper, furniture, tools, clothing, etc. Ample water power is furnished by the river. It is the seat of the State House of Correction, and the State Asylum for the Dangerous and Criminal Insane. It has also large railroad repair shops. Its public buildings include a high school and a library. Pop., 1920, 6,935.

IONIAN ISLANDS (38° 30′ N., 20° 30′ E.), group of islands on W. coast of Greece, consisting of seven islands: Corfu, Cephalonia, Paxos, Santa Maura (Leuka), Ithaca, Cerigo (Kythēra), Zrante (Zakynthos); surface mountainous; highest peak, Monte Nero, 5,310 ft., in Cephalonia; subject to frequent earthquakes; rich in marble, sulphur, salt, coal, wine, olives, currants, fruit. Formed into a province called Thema of Cephelenia, IX. cent.; gradually taken by Venetians from XIII. cent. onwards; Passed to France, 1797; made an independent state, 1800; retaken by French, 1807; came under the protection of Brit., 1815; ceded to Greece, 1863. Area, *c.* 1,100 sq. miles. Pop. *c.* 265,000.

IONIAN SCHOOL OF PHILOSOPHY, name given to group of philosophers about 600-400 B.C., who interpreted the universe scientifically rather than, like others, metaphysically. They may fairly be said to have started European philosophy. Thales declared water to be the underlying principle of all things. Anaximenes thought it was air, and Hippo moisture. Anaxagoras thought the Universe the work of mind, conceived as thin substance.

IONIANS, inhabitants of Attica (held by some to have been the cradle of the race), Eubœa, W. coast of Asia Minor, Cycladic Islands, and of colonies in Thrace, Propontis, Pontus, and Egypt. Origin of name is unknown, but Homer and Herodotus use it. A mythical ancentry is attributed to Ion.

IONIC ARCHITECTURE. See ARCHITECTURE.

IONISATION, the dissociation of a molecule into electrically charged ions (*q.v.*). The phenomenon, according to the ionic hypothesis, can occur either in a gas or in the solutions of compounds. Before an electric current can pass through a gas or a solution, it is held that some ionisation must occur. In the case of a gas which is a poor conductor, ionisation may be brought about by passing X-rays through it, whereupon it become a good conductor. Similarly, a gas subjected to strong electrostatic discharge becomes ionised. An elaboration of the theory maintains that the ions of the gas travel with immense velocity and collide with neutral molecules. These molecules, by the force of the collision, are themselves broken up into ions, which in turn collide with other molecules. In this way, an enormous increase in the number of ions is brought about. The solutions of all salts are supposed to be more or less ionised, and when the two poles of a battery are dipped into a solution, the positively charged ions (metallic) travel to the negative pole, while the negatively charged ions (acidic) travel to the positive pole. As soon as the charged ions come in contact with oppositely charged electrodes, they lose their charge and thereby become ordinary atoms, or groups of atoms as the case may be, with ordinary chemical activity. The ionic hypothesis has been much attacked by some chemists of high standing, but while there are still many points connected with it which require explanation, it undoubtedly contains much truth and it serves a useful purpose until such time as the phenomena it seeks to explain can be further elucidated. (See also DISSOCIATION.)

IONS, the term originally used by Faraday to describe the components of a chemical compound set free when an electric current is passed through its solution. The word is derived from the Gk., and means 'traveller,' and those parts of the decomposing compound which travel to the anode are called

anions, while those which go to the kathode are termed *kations*. It is assumed that when a salt is dissolved in water, there occurs a certain amount of dissociation, (*q.v.*) ions, consisting of atoms or groups of atoms, being produced. These ions carry either a positive or a negative charge of electricity, and each molecule, on dissociation, forms two ions having equal and opposite charges. It should be carefully noted that ions are not held to be identical with chemical atoms. Thus, a solution of sodium chloride may contain positively charged sodium ions and negatively charges chlorine ions, but seeing that metallic sodium reacts violently with water it is clear that there cannot exist, in the solution, any free sodium atoms. The ionic hypothesis is that the ions of sodium and chlorine are highly charged, electrically, and that the presence of these charges keep the ordinary chemical activities in abeyance. Dr. R. A. Millikan, an American physicist, was awarded the Nobel prize in Nov. 1923 for isolating the ion. See also IONISATION.

IOVILÆ, name given locally to Osco-Umbrian monuments (of V. and preceding cent's. B.C.) in Italy.

IOWA, N. central state of U.S. (42° N., 93° 30′ W.); bounded N. by Minnesota; E. by Mississippi R., which separates it from Wisconsin and Illinois; S. by Missouri; W. by Missouri and Big Sioux rivers (separating it from Nebraska and S. Dakota). Surface is mostly rolling tableland or prairie (average elevation being scarcely 1,000 ft. above sea-level), broken by vertical cliffs at river banks in N.E., and bluffs near rivers in S.W. Iowa is divided into two drainage systems: the larger, on the E., drained by tributaries of the Mississippi—Des Moines, Skunk, and Iowa; and on the W. by tributaries of the Missouri. There are several small lakes in the N. The climate is healthy. Valuable deposits of coal, which is of good quality, extend over 19,000 sq. m.; other minerals are lead, gypsum, limestone, clay, etc. The land is almost entirely devoted to farming—about half to the growing of cereals, chiefly corn, wheat, barley, oats, rye, potatoes, hay, etc.; naturally, industries are mainly agricultural and livestock rearing; other industries are meat packing and preparing food stuffs; dairy farming and poultry keeping are also of importance. There are no important manufactures. The chief towns are Des Moines (cap.), Dubuque, Sioux, Davenport, Council Bluffs, and Cedar Rapids. Iowa was organized as territory, 1838, and admitted as state of U.S., 1846. The state has a lieut.-governor, a senate and house of representatives, and sends 2 senators and 11 representatives to Congress. Area, 57,147 sq. m. (561 sq. m. water). Pop. 2,404,021. See Map of U. S.

IOWA CITY, a city of Iowa, in Johnson co., of which it is the county seat. It is on the Cedar Rapids and Iowa City, and the Chicago, Rock Island and Pacific railroads, and on the Iowa River. It is the trade center for a large agricultural area and its industries are of great importance, and include the manufacture of flour, jewelry, etc. There is also an extensive meat packing industry. Power is furnished by the river. It is the seat of the State University of Iowa, Iowa State Academy, State Historical Society, and Library. There are hospitals, a Masonic Temple, and other public buildings. Pop., 1920, 11,267.

IOWA RIVER, a stream that rises in Hancock county, near the Minnesota state line, and flowing in a S.E. direction empties into the Mississippi N. of Burlington. It is 300 miles long, and is navigable to Iowa City, 80 miles from its mouth.

IOWA STATE COLLEGE OF AGRICULTURAL AND MECHANICAL ARTS.—A co-educational and technical institution at Ames, Iowa, founded in 1868. There are five divisions of instruction — agriculture, engineering, household economy, industrial science, and veterinary medicine. The campus and farms cover 1,539 acres. The land is valued at $208,979,500, and the buildings cost $2,715,085. The library contains over 50,000 volumes. Professors, 182; instructors, 122; total students registered, 6,104.

IOWA STATE UNIVERSITY.—A co-educational institution at Iowa City, established in 1847. It provides courses in liberal arts, applied science, medicine, dentistry, law, and graduate. There are also schools of pharmacy, correspondence, and for trained nurses. A University armory, psychopathic hospital and nurses home were completed in 1921, and a chemistry building, and Iowa Memorial building for service men in 1922. Over 1,500 students attend the summer session. The library contains 173,000 volumes. Total income about $3,151,000. President, W. A. Jessup, Ph.D. Students, 5,000; teachers, 500, 1922-1923.

IOWA WESLEYAN UNIVERSITY.—institution for both sexes, at Mount Pleasant, Iowa, established in 1844, under the auspices of the Methodist Episcopal church. Admission is non-sectarian. The library contains over 12,000 volumes. Productive funds,

$650,000. Students, 295; teachers, 26, 1922-1923. President, W. S. Smith.

IPEK (42° 34′ N., 20° 27′ E.), town, Albania; until 1690 seat of the Serbian patriarchs. Pop. *c.* 15,000.

IPHICRATES (*d. c.* 353 B.C.), Athenian general, distinguished in Corinthian War, 395-87, Egypt, 378-74, and against Sparta, 372-71; inventor of new armor.

IPHIGENIA (classical myth.), Gk. legendary character, fixed to some extent by Euripides and other poets; *dau.* of Agamemnon and Clytæmnestra; sacrificed to Artemis (Euripides' *I. in Aulis*); according to one of the floating stories, she was miraculously caught away by Artemis; with her *bro.* Orestes became chief character of another play of Euripides', *I. in Tauris.*

IPSWICH (1) (52° 4′ N., 1° 10′ E.), seaport, Suffolk, England, on Orwell estuary. Noteworthy public buildings are the town hall, corn exchange, museum, and church of St. Mary le Tower. I. has a grammar school refounded by Queen Elizabeth, in 1565; manufactures agricultural implements; artificial manures; and has breweries and tanneries; sacked by the Danes in 991 and 1000. Pop. 73,939.

IPSWICH, a town in Massachusetts, in Essex co. It is on the Boston and Main railroad, and on the Ipswich River. The industries include planing mills, grist mills, and plants for the making of hosiery, boats, and canoes. There is a library, a home for aged women, a house of correction, and a high school. Ipswich is one of the oldest towns in Massachusetts, and was settled under the name of Agawam, in 1633, by John Winthrop. Pop., 1920, 6,201.

IQUIQUE (20° 10′ S., 70° 7′ W.), seaport, Chile, S. America; exports nitrate of soda and iodine. Pop. 45,000.

IQUITOS (3° 40′ S., 72° 57′ W.), town, river port, Peru, S. America, on Upper Amazon; center of trade; exports rubber. Pop. *c.* 20,000.

IQUITOS, tribe of uncivilised S. Amer. Indians.

IRAK (34° 30′ S., 50° E.), fertile province, Persia; carpet-weaving industry; capital, Sultanabad.

IRAK-AJEMI (34° N., 52° E.), province, Central Persia; produces grain and fruits; contains Teheran, the capital, and Isaphan. Area, 138,190 sq. miles. Pop. *c.* 3,000,000.

IRAK, OR IRAQ, KINGDOM OF, a kingdom which comprises in its area practically the land known as Mesopotamia, and including the former Turkish vilayets of Bazra, Bagdad, and Mosul. It is bounded on the N. by Kurdistan, on the E. by Persia, on the S. by the Persian Gulf and Kuwait, and on the W. by the Arabian and Syrian deserts. It has a total area of 143,250 sq. miles and a population of about 3,000,000. The capital is Bagdad, and the chief port, Bazra. By the Treaty of Sèvres, in 1920, Great Britain was given a mendate over Mesopotamia as an independent state, as the British and Indian forces as conquered the country during the war. The British High Commissioner established a provisional government in November, 1920, and on August 23, 1922, Prince Feisal, the *s.* of Hussein Ibn Ali, King of Hedjaz, was crowned King of Irak, as a constitutional Democratic sovereign. He has his seat of government at Bagdad. A treaty of alliance was signed between Irak and Great Britain, on October 10, 1922. Under this, Feisal agreed to be guided by the King of England on either national or financial obligations during the existence of the treaty, which remains in force for thirty years. Great Britain, on the other hand, agreed to render such support and assistance of the armed forces of the King of Irak as might be necessary. The chief value of this territory is in its petroleum deposits, especially in Mosul, and the British control over this area was hotly disputed by the Turkish delegates at the Conference of Lausanne. Great Britain, however, refused to relinquish her control. See map of Asia.

IRAN (30° N., 60° E.), the great plateau including Persia, Afghanistan, and Beluchistan; now official name of Persia.

IRANIAN LANGUAGE. See PHILOLOGY.

IRBIT (57° 29′ N., 63° 4′ E.), town, Perm, Russia.; famous annual fair. Pop. 20,000.

IRELAND, OR IRISH FREE STATE, the western of the U.K. (51°-55° N., 5°-10° W.); is bounded N., S., and W. by the Atlantic Ocean, N.E., by the North Channel (separating it from Scotland, Mull of Kintyre, 14 m.), E. by the Irish Sea and St. George's Channel (spearating it from England and Wales, 44 to 86 m.). (See map of British Isles.) The area is 32,586 sq. miles, including 760 sq. miles of inland water; the coast is about 2,200 m. long, with so many inlets that no place is more than 50 m. from the sea. The isl. has a basin-shaped central plain, 250 to 300 ft. in height, surrounded by the mountainous coasts

(2,000 to over 3,000 ft. in height). As there is a great deal of rain from W. and S.W., this configuration naturally results in a large area of bogland. Rivers are (N.) Foyle, Bann; (E.) Laggan, Boyne, Liffey; (S.) Barrow, Suir, Blackwater, Lee; (center and W.) Erne, Moy, Galway, and Shannon. Good-sized lakes are Neagh, Erne, Allen, Ree, Derg, Conn, Mask, Corrib, Killarney.

The rim of mountains in the direct path of the warm, damp W. and S.W. winds from the Atlantic (the wind is in the W. for about three-fourths of the year) gives wet, warm climate of W. Ireland. The rainfall in the hilly dist. varies from 70 to 75 in., and in the centre and along some parts of the E. coast from 25 to 30 in., the summer temp. ranges from 58° F. in the N. to 62-5° in the S., and in winter 39° surrounds an oval in the centre and N.E., and the rest of the country ranges from that up to 43° on the S. and S.W. coasts. It is believed that Archæan rocks show in co. Tyrone; there is no Cambrian stratum, with the possible exception of tracts in the E. and central plain, where the Silurian rocks appear; there are Devonian strata in Kerry, Cork, and round the Silurian tracts of the wide Carboniferous Limestone dist. of the central plain. There are Upper Carboniferous strata in Clare, Limerick, Trim, Kilkenny, and Tipperary; Lower Carboniferous sandstone and slate in S.W. Cork, Donegal, Tyrone, and Antrim. Coal (84,557 tons in 1915) is obtained chiefly in Kilkenny and Tipperary. The excellent slate, marble, and stone are little worked; there is some iron ore (Antrim); bauxite and silver ore are also found. There are 5,272,000 ac. of arable land, 9,121,000 ac. of permanent grass, and 296,000 ac. of woods and plantations; *c.* 3,000,000 ac. are mountain-land, peat bog, or marsh. The crops in order of extent are oats, sown grass, potatoes, turnips, and flax. The cattle number about 4,900,000; sheep, 3,750,000; pigs, 1,000,000; horses, 600,000. Efforts are being made to extend the cultivation of flax, which has declined in last fifty years, and to introduce grass and straw-plait as domestic industries. Horse breeding is important all over the country; young cattle are largely exported for fattening in Great Britain; and there is a valuable trade in bacon, ham, and pork, the chief centers being at Belfast, Limerick, Cork, and Waterford. Co-operative dairy-farming has been developed. The trade in butter has increased, and there are signs that Irish dairy produce may recover its old repute. The valuable E. coast fisheries (mackerel, cod, ling, and herring) are largely exploited by Eng. and Scot. fishermen; there are salmon fisheries on coasts and rivers.

Irish dyed and woven linens and serges, known as far as Italy in the Middle Ages, ceased to be important in the XVI. cent., and in modern times Ireland has been handicapped by lack of coal. A considerable linen industry, however, has developed round Belfast; in connection there is extensive shirt-making industry in Londonderry. Dublin manufactures poplin. Domestic and convent industries in hand-made lace and embroidery, spinning of wool and hand-loom weaving of woolens, carpets, rugs, etc., are noted and are being fostered by technical instruction. There are small leather and boot and shoe industries in various parts. Brewing of porter and ale and distilling are also important, the chief centers being Dublin, Cork, Dundalk, Kilkenny, Limerick, and Belfast. Belfast and Londonderry have shipbuilding. See Map of British Isles.

Ireland in divided into the four provinces of Ulster (in which are counties Antrim, Armagh, Cavan, Donegal, Down, Fermanagh, Londonderry, Monaghan, Tyrone), Leinster (counties Carlow, Dublin, Kildare, Kilkenny, King's, Longford, Louth, Meath, Queen's, Westmeath, Wexford, Wicklow), Munster (counties Clare, Cork, Kerry, Limerick, Tipperary, Waterford), and Connaught (counties Galway, Leitrim, Mayo, Roscommon, and Sligo.).

There is an excellent canal system 848 m. in length. Two canals (Royal, *c.* 100 m. in length. Two canals (Royal, *c.* 100 m.; and Grand, 166 m. including branches) connect Dublin with the Shannon, which is itself navigable, with the aid of a canal near Limerick, from Lough Allen to the sea. There are 3,210 m. of railway; the chief lines are the Great Northern (Dublin to Belfast and Londonderry), the Belfast and Northern Counties, the Dublin, Wicklow, and Wexford, the Midland Great Western (from Dublin), and the Great Southern and Western from Dublin to Cork, Valentia, Waterford, Tuam, and Athlone; the turnpike roads are almost confined to the neighborhood of towns; Atlantic liners by the N. passage call at Moville, those by the S. at Queenstown. Steamer lines to Great Britain run from Belfast, Larne, Dublin, Kingstown, Rosslare, Waterford, and Cork.

Church of Ireland.—When Christianity was first preached in Ireland is unknown, but the real conversion of Ireland was undoubtedly due to St. Patrick in the V. cent. Till the XI. cent. the Celtic Church flourished, producing saints and scholars and maintaining customs different from those of Rome. At length it succumbed, and Christianity followed the Roman model. The Irish Supremacy Act was passed in 1537, and

the Church was reformed like the English, but the bulk of the people remained faithful to Rome. The Anglican Church, disestablished in 1869, has two archbishops, eleven bishops, and 1,400 churches, and about 10 per cent of the general pop. belong to it.

The R.C. Church has four archbishops (of Armagh, Cashel, Dublin, and Tuam), and twenty-three bishops. The great majority (73-9 per cent in 1911) of the pop. is R.C. There are also Prot. Episcopalians, Presbyterians, Methodists, and small bodies of Independents, Baptists, and Jews.

Dublin Univ. was founded in 1591; the National Univ. of Ireland (Dublin), 1909; Queen's Univ. (Belfast), 1909.

History.—There are remains of the Neolithic and Bronze Ages. It is believed that a good deal of pre-Celtic blood runs in the inhabitants of W. Ireland, but no human remains of that time have been found to throw light on early history. The Goidels possibly colonized Ireland in the great age of Celtic civilization, the VI. cent. B.C. Unfortunately Ireland escaped the Roman domination, and so had no tradition of central government to modify the tribal system, which did not die out until the XVI. cent., when neighboring countries had become strong modern states. Some parts seem however, to have learned Christianity from the Romans; Palladius is said to have been sent here by the Pope, in 431, as missioner, and in the following year St. Patrick commenced the systematic conversion of the land. By Irish missionaries the N. of England was converted, and, like Ireland, came to differ from the Roman Church as to the date of observance of Easter, the tonsure, etc. The great monastic schools of the N. of England owed their foundation and their characteristics to Ireland. The Danes invaded Ireland, but never settled there.

Ireland was a rich country at this time, and the Norman rulers of England turned their thoughts toward its conquest; but the first step towards Eng. rule was taken under Henry II. The occasion of Henry's interference was the appeal of Dermot of Leinster to the barons of Wales for aid in a tribal dispute. They assisted him, in 1167, and then settled in Ireland, intermarrying with the native chiefs. In 1172 Henry II. landed, received the homage of both Eng. and Irish chieftains, and made his *s.* John lord. Eng. authority was, however, nominal. The Norman lords settled round Dublin in the district known as the Pale. In this district Eng. law was supposed to be administered, but Irish customs crept in, and Normans (for instance, the Butlers and Fitzgeralds) became the heads of clans and regarded England in much the same way as the Irish did.

While England was in the throes of the Wars of the Roses, Ireland became practically a foreign country. Henry VII. made an attempt to reduce the country. Eng. policy in allowing the Fitzgerald Earl of Kildare to be deputy (then the title of the Eng. governor) was merely a recognition of the *de facto* ruler, and would, no doubt, have been continued but for the support given by Kildare to the Yorkist party. Henry replaced him by the Eng. deputy, Poynings, who made the celebrated law, 1494, by which the independence of the Irish parliament was taken away; but he found his position untenable without a large army, and Henry VIII. practically abandoned the task by replacing Kildare. Henry VIII. sent generals to make demonstrations, but followed his father's policy in the main until Thomas Cromwell persuaded him to enrich his coffers by forcing the Reformation of Ireland. Besides suppressing the monasteries Henry persuaded the chieftains to accept Eng. titles and acknowledge his supremacy, and in 1542 took the title king. Edward VI. continued the reforming policy, and Mary, although she restored Catholicism carried out the new policy of colonization. King's co. and Queen's co. being planted and named after herself and Philip. With the whole of Catholic Europe against her, the tenure of Ireland was a life-and-death matter to Elizabeth. She was the first to subjugate the entire country, and war, massacre, and devastation were employed in the final subjugation of the chieftains and breaking up of the tribes. After baffling England for years, Shane O'Neill was entrapped and slain, in 1567.

After the Desmond revolt Munster, devastated so as to be almost uninhabitable, was planted by Eng. colonists, 1583; the second Desmond revolt, which brought about the disgrace of Elizabeth's favorite, Essex, the last rising of an Irish chieftain, was put down in 1601. The O'Neill renounced his tribal leadership, in 1603, James I. introduced the shire system into Ireland and the Eng. system of land tenure, while in 1610 Ulster was planted with settlers whose descendants have ever since upheld Brit. ideas and the Prot. religion. Ireland enjoyed some prosperity under Earl of Strafford, who not only ruled despotically as deputy, but exploited the country in order to furnish money for Charles I., offering the Irish army to the king for his struggle against the Parliament. Strife between the Catholics and Protestants was now complicated by the question of Eng. king *versus* the ardently puritanical Eng. Parliament, until Oliver Cromwell landed in

Ireland, in 1649, captured Drogheda and Wexford, and carried out massacres which have left his name as hated ther as that of Elizabeth. Emigration was freely allowed, Cromwell, like Elizabeth, 'made a solitude and called it peace.'

By the Act of Settlement, in 1661, a large proportion of the lands confiscated by Cromwell was confirmed to Eng. tenants, and the Roman Catholics gained, nothing at first but the religious change, since Puritanism merely gave way to restored Episcopacy. James II. cr. the Catholic Talbot Earl of Tyrconnel, and in 1687 made him deputy as an encouragement to Romanism. The result of the revolution of 1688, therefore, was that Ireland became a stronghold of the Jacobite cause, Tyrconnel leading an anti-Prot. revolt. James II. landed in 1689, and the Irish Parliament repealed the Act of Settlement. This led to the final conquest. In Ulster the Prot. towns of Londonderry and Enniskillen held out for the Orange cause until aid came. William III. landed, won the battle of the Boyne, and drove the Irish army before him into Limerick, which repelled every attack. James fled after the Irish defeat at Aughrim, 1691, William again laid siege to Limerick, and the city capitulated after a famous resistance, 1691. The terms of the Treaty of Limerick were disputed and their intent disregarded by the English Further Irish lands were confiscated and the penal laws against Catholics introduced. These laws merely strengthened the hold of Roman Catholicism on the Irish, but fines reduced the propertied Irish classes, and deliberate discouragement of Irish trade prevented the growth of a Catholic middle class. Opposition gradually grew during the XVIII. cent., potato famines commenced their ravages, secret societies committed outrages, and the hatred, still strong, between Ulster and the rest of Ireland sprang up.

A new danger to England was the growing Prot. discontent. The revolt of the Amer. colonies was received with joy in Ireland, where hopes of emulation arose. The agitation of Flood and Henry led to commercial concessions, in 1779, and Britain found herself obliged to grant political rights. The Irish parliament made a declaration of independence, 1782, and Rockingham's ministry was forced to assent to the repeal of Poyning's Act. Under the influence of Grattan the newly emancipated parliament passed measures of Catholic relief, and, in 1793, the Catholics received the franchise. During the Fr. revolutionary period the Society of United Irishmen was formed, in 1791, to unite all creeds in political opposition to England, but Irish Protestants, alarmed by Grattan's measures, began to arm against the Catholics. The rebellion of the United Irishmen, put down at Vinegar Hill in 1789, led, therefore, to nothing but Brit. conviction of the necessity for British legislative union. The separate Irish parliament was abolished by Pitt's ministry, in 1800, but owing to the pious obstinacy of George III., Catholic emancipation was not granted.

Catholic emancipation was the next subject of struggle. Daniel O'Connell founded, in 1823, the Catholic Association, which, in 1829, wrested emancipation from the government, Peel supporting the cause, and Wellington finding himself obliged to give way. O'Connell, however, continued his agitation for repeal of the Union until his death, in 1847. The Whig ministries of Grey and Melbourne passed the Irish Church Act, 1833, and the Tithes Commutation Act, 1838, which settled the tithe disputes; but the agitation of O'Connell proved a serious danger, and he was tried and imprisoned for sedition, in 1844. The Young Ireland party, however, took his place. The terrible potato famine of 1846-47 led to the Fenian outrages. The Fenian movement was not suppressed until 1867. The first act of Gladstone's first ministry was the disestablishment of the Irish Episcopal Church, 1869, and the first Land Act followed, making eviction illegal except for non-payment of rent, 1870.

The Home Rule party now commenced its agitations, and the Land League was established, in 1879, with Parnell as president. It worked for separation from England and boycotted those who rented lands and houses from which the previous holder had been evicted; this severe ostracism was named from a landlord's agent. Captain Boycott, whose crops would have rotted on the ground but for the intervention of the Ulster organization of Orangemen, fierce opponents of the Home Rule party through fear of Catholic supremacy. The indictment of Parnell for conspiracy failed, it was believed, through terrorization of the jury. Parnell and thirty-five other Irish members were suspended for their obstruction of the Coercion Bill in the House of Commons. Gladstone's second administration passed the second Irish Land Act, 1881, granting free sale, fair rents, and fixity of tenure ('the three F's'). Parnell's denunciation of the Act and incendiary speeches led to his speedy imprisonment. The Phœnix Park murders, among other outrages, followed and, in 1882, the National League took the place of the suppressed Land League. To aid the tenants the Arrears Act was passed, in 1882, Laborers Acts, in 1883, and the Ashbourne Act, in 1885. Gladstone now

became an upholder of Home Rule, and as premier for the third time wrecked his government, in 1886, by Home Rule and Irish Land Purchase Bills, his proposals causing wild riots in Ulster. The split in the Liberal party on this question created the Liberal Unionists.

Under Lord Salisbury's government, 1886-92, Mr. Balfour, as secretary for Ireland, practiced stern repression and put down agrarian disorder with an iron hand. Allegations in the *Times* charging Parnell and others, on the strength of certain letters in the possession of that paper, with conspiracy and complicity in crime, led to the Parnell Commission, which began to sit in 1887, and reported in 1890. The letters were proved to be forgeries, and the commission's report was a practical vindication of Parnell. In 1890, he was a co-respondent in a divorce case, and the adverse verdict split up the Irish party. He *d.* in the following year. In 1892, Gladstone returned to power and passed a second Home Rule Bill through the Commons, only to see it summarily rejected by the Lords. In 1896, Lord Salisbury's Land Act extended the powers of the Act of 1881. In 1898, local government on the lines of that obtaining in Great Britain was set up. Co-operative agriculture now began to make strides; in 1899 a department of Agriculture and Technical Instruction was established. A regiment of *Irish Guards* was embodied in 1902. In 1903, a new Land Act supplemented the Act of 1896, and established a complete and comprehensive system of land purchase, by which Irish landlords were encouraged to sell their land to tenants. Up to March 31, 1918, more than $500,000,000 had been advanced for this purpose. Gradually Ireland became a land of small holders, in 1917, 367,058 persons owned their own farms. In 1907, under Sir Henry Campbell-Bannerman's government, Mr. Birrell proposed the establishment of an Irish Council, but received no support from the Nationalists; his National University Bill, however, became law, in 1908.

In April, 1912, after the passing of the Parliament Act, Mr. Asquith introduced his Home Rule Bill, which evoked intense opposition in Ulster. Sir Edward Carson, the leader of Ulster resistance, organized a covenant, which was signed at Belfast, on Sept. 28, 1912, pledging the signatories to defeat the present conspiracy to set up a Home Rule Parliament, and in the event of its establishment to refuse recognition of its authority. The bill was rejected by the Lords, 1913, and in the same year the Ulster Volunteers were formally inaugurated and speedily attained an estimated strength of 100,000 armed and drilled men. Late in 1913, the government forbade the importation of arms and ammunition into Ireland, but in April, 1914, a large consignment of military supplies was landed and distributed in Ulster in defiance of the law. Matters were further complicated in March, 1914, when a number of army officers resigned in order to avoid service in Ulster. The Home Rule Bill, after being twice rejected by the Lords, was carried by the Commons for the third time, on May 25, 1914. Civil war seemed to be on the eve of breaking out when the king asked the rival Irish leaders and certain members of the government and opposition to meet at Buckingham Palace and try to find a way out of the difficulty. Unhappily the conference was fruitless. On Monday, July 27, the National Volunteers formed on the model of the Ulster Volunteers, came into conflict with the military during an attempt at gun-running; three persons were killed and forty others wounded. A few days later Britain declared war on Germany, and for the first time in history, Irish loyalty was pledged to the Brit. cause, and the pledge was strictly observed by the leaders of the Irish Parliamentary Party. Home Rulers and Unionists alike became recruiting sergeants, and Ireland furnished a large continent of troops for service against the enemy. The association known as *Sinn Fein*, which had begun as a non-political society, had by this time passed into the hands of men bitterly hostile to England. The Sinn Feiners were furiously angry when, in July, 1914, the control of the National Volunteers was taken out of their hands, and from the beginning of the war they discouraged recruiting for Brit. army in every possible way.

On Sept. 14, 1915, the prime minister introduced a bill to suspend the coming into operation of the Home Rule Act until the end of the war. He pledged himself to introduce in the following session an Act attending the measure, and further declared that Ulster should not be forced to come under the control of a Dublin parliament. The suspending bill was passed. For the next six months Ireland seemed to be tranquil but it was clear that the Sinn Feiners were preparing for rebellion. The outbreak occurred in Dublin during the Easter week of 1916 April 20-May 1. A Royal Commission was set up 'to inquire into the causes of the recent outbreak of rebellion in Ireland', and early in July issued its report, which condemned the government and singled out Mr. Birrell, his secretary, and the lord-lieutenant for special blame. Mr. Birrell and the lord-lieutenant at once resigned. Mr. Lloyd George was then

commissioned to use his well-known powers of conciliation and bring the rival leaders to terms. For a moment there seemed to be a chance of putting the Home Rule Act into force, but difficulties arose and the golden opportunity was missed. In July, 1917, when Mr. Lloyd George had succeeded Mr. Asquith as premier, he set up an Irish Convention which included men of all shades of opinion in Ireland to formulate a scheme of self-government. The commission reported on April 13, 1918, but no *modus vivendi* was secured.

By the close of the year 1918 Sinn Fein had practically won over the greater part of Ireland, and the Irish constitutional party had lost influence everywhere. The general election of 1917 rang its death-knell. Seven Irish Nationalists alone returned to the House of Commons; the 73 Sinn Feiners who had been successful at the polls refused to attend Westminster. Thereafter, the condition of Ireland grew speedily worse. In January, 1919, Lord French was appointed viceroy. Under the leadership of De Valera an Irish republic (*Dail Eireann*) was proclaimed, and a Sinn Fein parliament was set up which held a private meeting in Dublin in April, 1919. Crime steadily increased, and arrested Sinn Feiners resorted to hunger-strikes. Certain areas were placed under martial law, and in Oct. proclamations were issued suppressing the Sinn Fein association in Dublin city and county. In Dec. an attempt was made on the viceroy's life.

In 1920 many most daring murders were perpetrated in open daylight, and raids on police barracks and on isolated parties of soldiers were frequent. Large numbers of troops were poured into the island, and in the midst of what amounted to a condition of anarchy, a new Home Rule Bill was introduced into the House of Commons, Feb. 25, for the purpose of repealing the Act of 1914, and setting up separate parliaments for Ulster and the rest of Ireland. The Ulster members reluctantly accepted the bill, but no other Irish members took part in the discussions, and the Labor party refused to consider it. In Sinn Fein Ireland the bill was derided.

In March, 1920, Sir Nevil Macready was appointed to the command of army in Ireland, and a régime of martial law seemed to be foreshadowed. By this time Sinn Fein had organized itself and set up courts which practically superseded those of the king. In the third week of June after the Local Government elections, the Sinn Feiners published a long list of town and county authorities which had sworn allegiance to *Dail Eireann*. General Lucas was kidnapped on June 26, but afterwards escaped; murders and outrages continued. Riots involving deadly street fighting took place in Belfast during July and August. An attempt at intervention by Eng. trade unions came to nothing. Dominion government for Ireland, with county option for Ulster, was by this time freely discussed as a solution. In Aug. a bill was hurried through both houses of Parliament authorizing the government to substitute trial by court-martial where necessary, and to intercept grants to disloyal local authorities.

Violence and disorders of various kinds continued in S. Ireland throughout 1920, and especially violent outbreaks occurred in Dublin in November, when over 15 members of the Sinn Fein were killed when they resisted attempts at arrest. Several of the chief leaders who were imprisoned, undertook hunger strikes in protest. The most conspicuous of these was Terrence MacSwiney, Lord Mayor of Cork, who died after refusing food for 75 days. The situation had now become intolerable and both sides were in a mood to listen to compromise, and after various negotiations had been undertaken between leaders of the Sinn Fein and the British ministers, a series of conferences took place in London, and negotiations looking for a conference were conducted throughout the greater part of the year. De Valera, President of the Sinn Fein, insisted upon conditions which were impossible of fulfillment. These were finally modified, however, and Irish delegates to the conference were appointed. These were Michael Collins, Arthur Griffith, Robert C. Barton, Gavin Duffy, and E. J. Duggan. The conference met at Whitehall, London, on August 11, and continued until an agreement was finally reached on the treaty, which established the Irish Free State. By the terms of the treaty, Ireland was given the same constitutional status in the British Empire as the Dominion of Canada, the Commonwealth of Australia, New Zealand, and South Africa. It was given a Parliament, with power to make laws for peace and order and good government in Ireland, and an executive responsible for that parliament. Provision was made for the appointment of a governor-general to represent the Crown. Members of the parliament were required to take an oath of allegiance to Great Britain. All internal, economic, and political questions were left in the hands of the Irish Parliament. De Valera and a minority of the Irish Republican Parliament refused to accept the treaty, and at once began measures in opposition. The treaty was signed by the British Parliament in December 6, 1921, in spite

of strong opposition on the part of Ulster, which rejected the invitation to enter the Irish Free State. Riots and disorde broke out along the border of Ulster and S. Ireland. All these were finally quelled. De Valera resigned as president of the Irish Parliament, on January 9, 1922, and was defeated when proposed for re-election. Arthur Griffith was elected president in his stead. The Southern Parliament, as elected in May, 1920, was called and created a provisional government in which De Valera and his associates refused to take part. Michael Collins was chosen premier of the provisional government, to which Dublin Castle was delivered by the British authorities on January 15, 1922. This marked the first step for Ireland as an independent nation. The treaty had been ratified by the *Dail Eireann* on January 7, by a vote of 64 to 57. Hostilities at once broke out between the radical Irish Republicans under De Valera and the supporters of the Free State. The Republicans created riots and raids in Limerick, Dublin and other cities. On June 2, an arrangement was made with the Ulster government whereby it was to reserve neutrality in the Free State, and British troops were placed along the border. On January 15, the test of a constitution for the Free State was published and parliamentary elections were held the following day. These resulted in the election of 58 supporters of the constitution and 36 opponents. Late in June a body of Republicans took refuge in the Four Courts Building, Dublin, and surrendered only after a siege in which the greater part of the building was destroyed and several of the occupants killed. On August 21, Michael Collins was assassinated from ambush at random. William T. Cosgrave was elected President of the Free State Parliament, on September 9. Parliament, on October 25, approved the Constitition. Aggressive measures were taken against the Republican leaders still in the field, and Erskine Childers, considered to be the ablest intellectual leader, was captured and executed, on November 24. On December 6, 1922, the provisional government was superseded by the new Free State government, and the president took the oath prescribed by the Constitution. Timothy Healy was appointed the first Governor-General. Guerrila warfare continued through the greater part of 1923, although the Free State continued to grow in power and authority. A law was passed which provided the death penalty for any Republican captured carrying arms, and many of the Republican leaders captured were executed under this provision. By the middle of 1923 all the leaders, with the exception of De Valera, had been either captured or had left the country. Over 250 Republican participants fled to the United States in April. In spite of these disorders and economic difficulties, the Irish Free State governed Ireland sternly, and great progress was made in the establishment of a stable government. De Valera, in June, 1923, finally abandoned further resistance to the Free State. He was captured in July, 1923.

Northern Ireland.—Under the provisions of the Ireland Act of 1920, provision was made for the legislative, executive, and judicial departments of Northern Ireland, comprising six of the counties of the Province of Ulster, and the parliamentary boroughs of Belfast and Derry. The executive power continued to be vested in the king. Parliament consisted of a Senate of 26 members and a House of Commons, of 52 members. The legislature has full executive power, except in matters relating to the Empire. Northern Ireland was given 13 members in the National Parliament. The Duke of Abercorn was appointed governor-general of Northern Ireland, in 1922.

The pop. of Ireland, in 1911 (latest), was 4,382,951. The cap. is Dublin (pop. 309,272), but the largest town is Belfast (pop. 385,492); next come Cork (76,632), Londonderry (40,799), Limerick (38,403), and Waterford (27,430).

IRELAND, ALLEYNE (1871), author; *b.* in Manchester, England; educated at University of Berlin. Traveled over world from 1887-1897; lectured at Cornell University, 1899 and University of Chicago, 1900. Prepared report on Colonial administraton of different countries in Far East, 1902-1904, for University of Chicago. 1911-1914 on editorial staff of a New York paper. Author of: *Demerariana Essays*; *Georgetown Demerara*, 1897; *Tropical Colonization*,1899; *The Anglo-Boer Conflict*, 1900; *The Far Eastern Tropics*, 1905; *The Province of Burma* (2 volumes), 1907; *Joseph Pulitzer—Reminiscences of a Secretary*, 1914; *Democracy and the Human Equation*, 1921.

IRELAND, JOHN (1761-1842,) dean of Westminster; founder of Ireland scholarship at Oxford.

IRELAND, JOHN (1838-1918), an American Catholic prelate; *b.* in county Kilkenny, Ireland. He came to this country at the age of eleven and prepared for the priesthood in the Cathedral School, in St. Paul, Minn. In 1853 he went to France, where he finished his studies in the theological seminary of Meximieux. In 1861 he returned to the United States, and was ordained a priest in St. Paul. During the Civil War he

served as a chaplain, being attached to the Fifth Minnesota Regiment. After the war he became rector of the Cathedral of St. Paul. He gradually gained wide prominence as a persuasive speaker. As Director of the National Colonization Association he was influential in the establishment of many Roman Catholic colonies in the Northwest. In 1888 he made a visit to Rome, where he so deeply impressed the higher authorities of the Church, that he was made first Archbishop of St. Paul. Shortly after this he took the leadership in attempting to have a consolidation made of the parochial and the public schools, which plan was put into effect in Faribault, and Stillwater, Minn., but proved a failure. During President McKinley's administration he was sent abroad to present the attitude of the U.S. Government on numerous questions of international import. He wrote *The Church and Modern Society*.

IRELAND, WILLIAM HENRY (1777-1835), forger of Shakespearean documents (pub. 1795-96); the fraud and its disclosure caused even greater excitement than the Payne Collier forgeries later.

IRENÆUS, ST. (*c.* 120-200), pupil of Polycarp (disciple of St. John), brought up in Asia Minor; then bp. of Lyons; wrote *Adversus omnes Hoereses* ('Against all heretics') in Greek; Latin version and fragments of original survive; in it I. assails Gnosticism and defends Catholic doctrine and tradition; one of most important authorities for history of Christian Church in II. cent.; shows four gospels clearly established as canonical.

IRENE (752-803), Byzantine empress, murdered her *s.* Constantine, and reigned 797-802, when exiled; beatified by Gk. Church for restoring image worship. *Irene* (fl. 1100), Byzantine empress; intrigued against her *s.*

IRETON, HENRY (1610-51), Eng. soldier; general in Parliamentary army during Civil War; m. a *dau.* of Cromwell, and took leading part in trial of Charles I.; assisted in reduction of Ireland during Commonwealth.

IRIARTE Y OROPESA, TOMAS DE, YRIARTE (1750-91), Span. poet; author of amusing *Fabulas literarias*.

IRIDACEÆ, IRIDEÆ, order of cotyledonous plants with creeping, bulbous, or tuberous roots and root-leaves, (*e.g.*) Crocus, Iris, Gladioli.

IRIDESCENCE, the name given to the delicately-tinted, lustrous sheen found on mother-of-pearl and other finely-grooved surfaces, as well as on the wings of certain insects. It is due to the interference of waves of white light reflected from the different levels of the grooving.

IRIDIUM (Ir = 193.1), metal of platinum group; S.G. 22.4; M.P. very high; used for tips of fountain pens; forms hard alloy with platinum employed for standard length bars; salts derived from Ir_2O_3 and IrO_2.

IRIGA (*c.* 13° 20′ N.; 123° 30′ E.), town, S. Camarines, Luzon, Philippine Islands. Pop. *c.* 20,000.

IRIS. See EYE.

IRIS, the personification of the rainbow; in Gk. myth. *dau.* of Thaumas and Electra and messenger of the gods to mortals.

IRIS is a genus of perennial herbs of natural order *Iridaceae*; the root is a horizontal rhizome; leaves are long, narrow, and green; flowers, yellow or purple, are epigynous and regular. There are three petals, sepals, stamens, and stigmas. The sepals and stigmas function as petals. The ovary is tri-locular and inferior. The floral envelope is united at the base and carries broad bands of hairs. The *fleur-de-lis* is an iris.

IRKUTSK. (1) Government, E. Siberia, comprised between 51° and 62° 30′ N., and 96°-124° E.; stretches from Sayan Mts. on borders of Mongolia to valleys of Upper Lena and E. tributaries of Yenisei; greater part belongs to agricultural zone of Siberia, with enormous forests in the S. and S.E.; produces rye, wheat, barley, oats, buckwheat, and potatoes; coal, gold, iron, and salt; Lake Baikal fisheries are important; the native inhabitants are chiefly Buriats and Tunguses. Area, 287,000 sq. m.; pop. 733,000. (2) Tn., cap. E. Siberia (52°-17′ N., 104° 22′ E.); is chief trade center of E. Siberia; important traffic in tea and furs. During 1917-18 was scene of much street fighting between Red and White Guards; population was reduced to starvation, and town probably suffered more at hands of Bolsheviks than any other town in Russia. In Dec. 1919, seat of Russian Government in Siberia was transferred from Omsk to Irkutsk. Pop. (in normal times) *c.* 120,000.

IRMIN (Teutonic myth.), deity possibly invented to explain the *Irminaeulen* (Irmin pillars) of the Herminones. There are considerable remains of an Irminsal in Westphalia; it is possibly a relic of pillar-worship.

IRNERIUS (*c.* 1050-*c.* 1130), famous jurist of Bologna, little of whose work remains.

IRON AND STEEL.—The United States leads the world as a producer of iron and steel. In the world's production of 1920, the American output of iron amounted to 36,925,987 long tons, and of steel to 42,132,934 long tons, as against the production by the United Kingdom of 8,007,000 long tons of iron, and 9,056,000 long tons of steel. Germany, who before the World War, was a considerable rival of both the United States and Great Britain in this industry, as in others (and may be again), produced only 5,550,000 long tons of iron, and 7,710,000 long tons of steel. Up to 1880, British furnaces led the world in size and output, but about this time American iron foundries began to take the lead, and have maintained it ever since. In 1919, according to the Census Bureau, there were 20,120 establishments in the United States engaged in manufacturing iron and steel and their numerous products. They employed 1,585,712 workers, and had an aggregate output of goods valued at $9,403,634,265. The United States thus has an industry with an annual production approaching ten billion dollars in value and on the way to exceeding that figure. Of the establishments enumerated, 195 were blast furnace plants, the value of whose production was $794,466,558, and 500 were steel works and rolling mills with an output worth $2,828,902,376.

Like other countries containing beds of metallic ores, the United States has many iron areas still unexploited. There is active production in twenty-one states. The principal deposit (hematite) is extensively mined in the Lake Superior district of Minnesota, Wisconsin, and Michigan, which furnishes most of the ore used in American plants (some 80 per cent), but the output from the Great Lakes ranges does not meet the demand, and further ore is obtained from Cuba, Spain, Canada and Sweden. Duluth is the chief shipping point for transporting the Great Lakes ore to the iron and steel industrial centers. Large deposits of hematite round Birmingham, Alabama, have developed a considerable mining industry in that state, while New York has bodies of magnetite ores, found in the Adirondacks and the Hudson Highlands. Pennsylvania and Ohio contain the more important iron and steel plants, and turn out most of the pig iron produced. The industry is also carried on in Indiana, Illinois, New Jersey, Maryland and Virginia. In Europe, which is estimated to contain 6,528,000,000 metric or long tons of unmined ores, the leading iron countries are Germany, Sweden, Russia, and Spain. The unmined ores of the world are estimated at 12,000,000,000 long tons.

The use of iron by man dates back for thousands of years, although, historically, it comes later than gold, silver, or copper, these metals being more easily obtained from their ores than iron. There is abundant evidence that the Romans manufactured iron in great quantities during their occupation of Britain. Their process was, however, very crude and wasteful. It was the inventions of the last two cent's. that resulted in the cheap production of iron in large quantities and its use for purposes hitherto undreamed of. About 1735, coke largely supplanted charcoal as a fuel; the process of puddling and rolling were invented by Henry Cort, in 1784; the hot blast was introduced by Neilson, in 1830; and in 1856, Bessemer patented his process of manufacturing steel.

Iron is the most important of the metallic elements. It is abundant over the earth's crust and of such universal occurrence that it is estimated to be the globe's largest metallic constituent next to aluminum. When pure, it is silvery white, but is found unalloyed only in small quantities. The American production of the metal for manufacturing purposes, notably its conversion into steel, is chiefly derived from hematite and magnetite ores. The metal is readily oxidized (rusted) in moist air, and susceptible to attacks by many corrosive agents. It is found in sea water and minerals and is an essential constituent of plants and animals. Not only is iron widely distributed over the earth in vast beds, but it exists in the sun and stars and falls through space to the earth in the form of meteorites.

The physical properties of iron cannot be definitely stated, because they are diametrically opposite in different varieties of the metal. Iron is both extremely hard and very soft, brittle in one form and ductile in another, easily susceptible to magnetism in one state and non-magnetic in another. One variety readily welds while another does not. Other contrary physical properties could be named. The chief factors that fundamentally affect its properties are the treatment it is subjected to in process of manufacture, the quality of carbon it contains, and the presence of impurities, however small in amount. Microscopic study has shown that foreign substances, such as sulphur and phosphorus, form a weak kind of mortar between the crystals of the metal and greatly reduce its strength. The presence of small quantities of carbon results in the production of a carbide which has a much finer structure than that of pure iron and adds to its strength.

The thermal treatment of iron produces remarkable changes. Steel be-

comes very hard and brittle if cooled quickly by plunging it while hot into a bath of water, but if cooled slowly it is malleable. Iron at a red heat is malleable and easily forged into any required shape, but not so when cold. Steel rails after prolonged use gradually become brittle and consequently dangerous, but if heated for some time at a temperature of about 900° C. they can be made tough and elastic again.

The commercial products of iron ores are never pure but contain valuable alloys, such as carbon, phosphorus, silicon, and sulphur. These products are pig, or cast iron, wrought iron, bar iron, and various forms of steel.

Cast iron is produced in a blast furnace or a forge, and contains a large proportion of carbon, some of which is segregated. It is an impure product, retaining or absorbing in its molten state more or less phosphorus, sulphur, manganese, or silicon, and must be refined or purified in order to convert it into better iron or steel. It is usually granular (*i.e.*, has a structure or texture resembling an aggregation of grains or small particles) or crystalline like granite (imperfectly crystallized) and is easily cast into moulds, but is neither ductile or malleable. Wrought iron is manufactured in a puddling-furnace or a forge, and, unlike pig iron, contains very little carbon or other alloys. It is ductile and malleable usually, as well as fibrous. Bar-iron and steel are compounds of iron widely differing in their constituents. They contain less carbon than cast-iron and more than wrought-iron, and can be cast, forged, tempered and hardened by heating to redness and suddenly cooling. All these varieties of iron differ not only in the degree of their qualities but in the proportion of their constituents.

Cast iron is the first product from the ore. In the blast furnaces employed to manufacture it, use is made of fluxes, or substances that promote the fusion of the impure constituent of iron, so that in the melting process the iron can be detached largely, though not wholly, from silicon and its other constituents. Lime, which readily unites with silicon, making of it a fusible slag, is largely used as a flux. The employment of fluxes enables the recovery of metallic iron from masses of low-grade ore at a comparatively cheap outlay. The old methods of smelting could not profitably treat ore containing less than 60 per cent metallic iron.

Iron is present as an oxide in the ores, and the process of extracting it consists in its deoxidization. The operation not only requires a high temperature, but contact with a deoxidizing substance. Both these conditions are met by the use of carbonaceous fuel (coke or charcoal), which provide the heat needed and also serves as the required reducing element in drawing the oxygen from the iron.

The layout of a furnace and its equipment consists of a number of closely knit structures with connecting pipes and tracks, namely, the furnace itself, the boiler plant, the blowing-engine plant, or stock house, ore and fuel tracks, fuel storage, pig-casting machine, and hot-metal and slag runners.

The furnace is a tall cylindrical tower or shaft, sometimes 100 feet high and 30 feet in diameter and its widest part, and in shape roughly resembles the outline of a lighthouse. It is built of firebrick jacketed by riveted steel plates and inside the stack it tapers both upward and downward. At the foot is the hearth or crucible, which holds the molten matter produced by heating; above the hearth are two outlets, one for discharging the liquid pig-iron, the other for expelling the detached slag, or fused impurities. Two other important openings, placed a little higher up, are the apertures through which the pipes that bring the blast from the engines project into the furnace. The ends or nozzles of these pipes are called tuyeres. The pipes are water-cooled, as are the internal walls from the hearth to the widest part of the furnace, to enable the structure to withstand the intense heat where it is most felt. The fuel, ore and flux enter the furnace from the top, whose opening is closed by a cup or cone to prevent the escape of gases produced by the heat. These gases, created by the furnace, are led out through a pipe to the heating plant outside, where they are used as fuel to heat the blast that created them. The cup or cone mentioned also operate as valuable devices for mixing and distributing the charge of ore, fuel and flux before it is injected into the furnace.

The blast entering the tuyeres comes from pipes connecting with the hot-blast main that lead to stoves or chambers made red-hot by the combustion of the recovered waste gases, one stove being heated while the others are furnishing heat to the blast. Hence the blast is very hot air, usually 550° C., and can be forced through the furnace at the rate of 40,000 to 60,000 cubic feet a second. The blast is started on its way from steam-blowing engines, which inject it into the stoves.

In charging the furnace, coke is sent in first, then the ore and limestone. So when the heated blast enters through the tuyeres it meets incandescent fuel, and the contact forms carbon dioxide (carbonic acid), whis is reduced to carbon monoxide by the reaction of contact with

additional coke. This gas goes up the stack to the descending ore, which loses its oxygen and becomes spongy and pasty on its course to the hearth. At the hearth, in contact with solid incandescent coke, the reduction of the iron is completed. The fused iron, on account of its weight, sinks to the bottom of the furnace with the slag floating on its surface, while the latter as it accumulates, flows through the slag hole. The molten iron, carburized by the fuel, is drawn off at regular intervals and either passes out along the runners for conversion into 'pigs' by sand moulds or by a pig machine, or transported in wagons to a steel-making furnace for refining ore conserved in a mixer.

The product, pig or cast iron, is of two kinds—gray and white—depending on the proportions in which the coke, limestone and ore are mixed. The white pig iron contains its carbon in a chemically combined form, and is used for making wrought iron and various forms of steel, while the gray iron, which has its carbon physically mixed throughout, is used for steel castings.

Cast iron is not forgeable; in manufacture it can only be utilized in its molten state by pouring it into casts or moulds that reproduce the shape of the article to be fabricated from it. Its prime service is that it forms the parent metal of all wrought iron and steel production, and to acquire the needful toughness and strength and other valuable properties it lacks in its primitive stage, it must be subjected to refining processes.

Wrought iron is produced from pig iron in an iron-plated furnace with a thick layer of oxide of iron or ferric oxide. The method is by puddling, *i.e.*, when the iron melts it is rabbled or stirred up to expose to the oxidizing action of the flame and the fettling (oxide lining) the impurities of carbon, silicon, etc., it retains. Wrought iron, however, has been largely displaced by the enormous development of mild, or soft steel, and its production is now not large.

The blast furnace produces other pig irons besides the ordinary kind. There are also pig irons made by the electric furnace or by reduction by aluminum. They are all ferro-alloys (alloys of iron with other metals), and are distinctive in having a high percentage of some special element. Those made by the blast furnace include ferrochrome, containing about 60 to 68 per cent of chronium; ferromanganese, any pig iron containing over 30 to 80 per cent of manganese, or spiegel, when the manganese is only 10 to 30 per cent; and ferrosilicon, containing 10 to 20 per cent of silicon. The electric furnace produces ferrosilicon if the silicon present exceeds 40 per cent. when it is known as 'special silicon'; also ferro-nickel, with 25 to 75 per cent nickel; ferro-tungsten, 60 to 85 per cent tungsten; ferrotitanium, 10 to 12 per cent titanium, or more; and ferro-vanadium, with 20 to 35 per cent vanadium. The last four named have more or less rare elements, which determine their price per pound. The others are much cheaper products except when they have been refined by some special process. These ferro-alloys are used in the preparation of steel or special properties.

The other and more familiar steels are known as soft or medium or high carbon steel. The two first may be produced in a Bessemer converter, or in an open hearth or electric furnace, while the hard steel is made in a crucible or electric furnace. Steel output, in fact, is classified by the method employed in producing it, such as Bessemer steel, open-hearth steel, cementation steel, crucible steel, and electric steel. Its character is also determined by whether it is 'acid' or 'basic' steel, according to the lining of the furnace.

As to the latter, the *acid* process is so-called from the character of the hearth lining, which is formed of nearly pure silicon sand, a substance chemically an acid. Pig iron treated in such a lined furnace loses nearly all its silicon, carbon and manganese, but the phosphorus and sulphur remaining are unaffected. The *basic* open-hearth process calls for a hearth lined with a material—usually calcined dolomite—that withstands the action of slags highly charged with lime. Otherwise the presence of lime in an acid furnace would disintegrate the hearth because of the strong fluxing action between silicon and lime when brought together at high temperature. By the *basic* process there is elimination of nearly all the silicon, carbon and manganese, as in the acid process, with the elimination of most of the phosphurs and part of the sulphur as well. Most of the total conversion of American pig iron into steel is effected by the acid Bessemer or the basic open-hearth processes.

The Bessemer process produces steel from molten pig iron by blowing air through it, thus oxidizing and removing the carbon, silicon and manganese. The open-hearth method involves a reverberatory furnace, *i.e.*, so constructed and vaulted that the rising flame and heat are thrown back towards the hearth or the upper surface of the ore, or so arranged that the producer gas (by which the furnace is fired) and air may enter at one end and burn over the hearth, while the intensely hot waste gases pass out at the other.

The purification of pig iron and its conversion into steel requires only a few minutes by the Bessemer process, but several hours in the open hearth. Sometimes the two methods are combined, an acid Bessemer converter first eliminating the silicon and manganese and much of the carbon, while a basic open-hearth furnace disposes of the phosphorus and the remaining carbon. The cementation process, or case hardening, gives to low-carbon steel a high carbon surface, first by a union of bar iron and carbon into 'blister' steel, then melting it to form crucible steel, and finally heating it to a high temperature in contact with carbon or a carbonaceous product, such as potassium ferrocyanide, from which contact the desired high-carbon surface is acquired. Electricity is becoming more and more utilized for plants producing high-grade steel, alloy steels, and steel castings. The resulting product of all these methods of manufacture is a variety of steel with a wide range of physical properties, according to the temperature and mechanical devices used in casting and shaping and the application of heat. When red or white hot, its strength and elastic limit are increased by mechanical treatment, while the application of similar treatment when the metal is cold also adds to tensile strength as well as hardness, but makes it subject to brittleness by decreasing its ductility. In heat treatment, the steel is either annealed, *i.e.*, slowly cooled from a high temperature to produce softness and ductility, but suffers a reduction of tensile strength; or hardened, *i.e.*, cooled quickly (the method is known as 'quenching'°, then retreated (the process here becoming 'tempering') to produce tools of exceeding hardness: or else it is further hardened and tempered at an intense heat to endow the steel with great strength and elastic limit, while not unduly affecting its ductility.

Much steel scrap is used in the purification of pig iron, and is also converted into new forms of steel. Every steel plant has great dumps of discarded steel equipment, such as cracked cylinders, broken piston rods, shattered wheels, bent axles, rusted spikes, old bolts, hammer heads, torn chains and cables, decrepit rails, split fishplates, rusted spikes and an infinity of other disused fabrications. A magnet crane will lift masses of such debris from the mountain-high dump and drop its load into scrap pans bound for the open-hearth furnace, where charging machinery pick up the pans and empty them through blazing doors into the seething flames shooting from the hearth. A few hours later the once useless scrap leaps white and molten out of the opposite side of the furnace, gushing through the tap-hole into an enormous ladle, which a gigantic crane, weighing perhaps one hundred tons, transports to the moulds, and the metal only reaches the forge and rolls for reconversion into new equipment.

Steel castings (acid or basic open-hearth, Bessemer, crucible or electric) enter largely into marine, locomotive, freight and passenger car, electrical and general machinery construction. Beyond the enormous demands for steel in these directions, where the need in certain parts for great strength and resiliency is paramount, the modern treatment of steel has made its use illimitable. In the fabrication of steel tubing, one of the most recent of big industries, developed by the demand for durable tubing in the production of automobiles, engines, furniture, baby carriages, beds, boilers, etc., machines have been perfected that convert flat ribbon steel or solid or hollow billets into a tube of rolling, which is then welded, polished and cut off into proper lengths in the same operations. The production of steel rails, structural shapes, wire rolls and nails comprise other monumental industries developed by scientific processes made possible by the better knowledge of metallography.

IRON BRIDGES. See BRIDGES.

IRON CROSS, order of knighthood for bravery in battle; founded by William III. of Prussia, 1813; revived, 1870.

IRON DUKE. See WELLINGTON.

IRON GATES, narrow gorge and rapids (now navigable) between Carpathians and Balkans.

IRON MASK name applied to a prisoner in the Bastile in Louis XIV.'s reign. The mask was in reality of black velvet, and its wearer's identity still remains matter for speculation. It is known that he was brought from Pignerol to Sainte-Marguérite, and transferred to Bastile, in 1698; that his face was always masked and his name never divulged; and that he died in 1703, and was buried at St. Paul, his name being then given as Marchiali, his age as forty-five. Early theories concerning his identity were numerous; among other conjectures, he is said to have been an illegitimate son of Louis XIV., an illegitimate son of Anne of Austria, a twin *bro.* of Louis XIV.; but all these and many other theories are now known to be incompatible with facts of history.

A later theory, which for some time gained credence, was that the Mask was Count Mattioli, Duke of Mantua's minister, who was imprisoned for treachery to Louis XIV.; but against this it is argued that Mattioli did not reach

Pignerol until several years after the masked prisoner's arrival there, and that he remained behind when the latter was transferred, with the gov., Saint-Mars, to Exiles. He has also been identified with an Ital. adventurer, M. de Marchiel, imprisoned on suspicion of plotting to assassinate Louis XIV., but other writers say that Marchiel was put to death in 1669. And, finally, he is thought by many critics to have been one Eustache Dauger, who, when in Bastile, acted as valet to Fouquet and whose previous history remains obscure.

IRON MOUNTAIN, a city of Michigan, in Dickinson co., of which it is the county seat. It is on the Chicago and Northwestern, the Chicago, Milwaukee and St. Paul, and other railroads, and on the Menominee River. It is the trade center for the mining region of Dickinson county, and for the adjoining farming area in Wisconsin. Iron mining is its chief industry. It derives excellent water power from the river. Pop. 1920, 8,251.

IRONSIDE, surname of Eng. king, Edmund, 1016-17; applied by Prince Rupert to Cromwell after *Marston Moor*, 1644, and afterwards to his soldiers.

IRONTON, a city of Ohio, in Lawrence co., of which it is the county seat. It is on the Cincinnati, Hamilton and Dayton, the Detroit, Toledo and Ironton, and the Norfolk and Western railroads, and on the Ohio River. Its industries include the manufacture of fire brick, iron, steel and nails. It is the trade center for an extensive mining and manufacturing and farming region, and is at the base of a range of hills which contain large deposits of iron ore and bituminous coal. Among the public buildings are a Memorial Hall, Mason and Odd Fellows Hall, and a public library; there are two parks. Pop. 1920, 14,007.

IRONWOOD, a city of Michigan, in Gogebic co. It is on the Chicago and Northwestern, and the Minneapolis, St. Paul and Sault Ste. Marie railroads. It is the trade center for the famous Gogebic iron region. The Norrie mine, one of the largest iron producers in the world, is here, and there are other large mines in the vicinity. Pop. 1920, 15,739.

IRON-WORK, important branch of hist. ornament; Germany had famous mediæval and Renaissance workers in this style.

IRONY, mode of speech conveying a meaning directly opposite to natural meaning of the words used; *cf.* Plato's dialogues, or Swift's arguments.

IROQUOIS INDIANS.—A confederacy of five, and later six, tribes of American Indians called by the English respectively, 'The Five Nations,' and 'The Six Nations.' They were the Mohawk, Oneida, Onondaga, Cauyga, Senaca, and later the Tuscarora. In 1535, the Frenchman, Cartier, found many of them settled along the St. Lawrence River from Quebec to Montreal. Scattered by the Algonquin, many went South to North Carolina. Hiawatha, their leader, formed the confederacy of tribes as a protective measure. In 1630, a bloody war began with the Algonquin. The Hurons in Canada conquered the Erie, the Ottawa, the Canestoga. The only tribes that continued to defy them were the Ojibwa of the N.W., and the Cherokees of the S. In 1712, the Iroquois were driven out of North Carolina, some to settle along the Mohawk River, New York, and the lakes which were named after them. In the French and British wars, the Iroquois sided with the British, excepting the Cuyagus and the Mohawks. As a league they were neutral in the Revolution, but some tribes helped the British. Oneidas and some Tuscaroras sided with the Americans. Descendants of the 'Six Nations' are in New York State; excepting part of the Oneidas in the W., and Senecas in Indian Territory. They number about 20,000.

IRRAWADDY, IRAWADI (16° 30′ N., 95° 5′ E.), principal river of Burma, India; total length, *c.* 12,300 miles; navigable for small craft; spreads into wide delta with some dozen mouths in W. of Martaban Bay; affords chief means of communication in Burma. On its banks stand Rangoon, Mandalay, Vassein, Prome, and Ava. Largest tributary is the Chindwin.

IRREDENTISTS, political party in Italy, which, in 1876, was placed at head of government; aimed at recovery of *Italia Irredenta* ('Unredeemed Italy'); *i.e.* those territories which at once time formed part of Italy, and were held by Austria and other powers.

IRRIGATION.—The artificial distribution of water over land to improve crop conditions. To be effective on a large scale, this calls for hydraulic engineering, a knowledge of crops and [soils and water conservation. Irrigation was practiced in the earliest times. In Egypt, as early as 2500 B.C., and remains of irrigation systems of unknown age are to be found in Europe, Asia, Africa, and the Americas. Open canals and laterals are the most widely used methods of irrigation. More recently, cement pipes that save loss by evaporation and perco-

lation are becoming increasingly popular. Various methods are used to flood the furrows and control the distribution of water. The Fourteenth Census reports, which were published in 1921, give the following statistics of irrigation in the United States for the year 1919, covering North Dakota, South Dakota, Nebraska, Kansas, Arkansas, and Louisiana, and the States between them and the Pacific. Irrigation to the E. is on a limited scale, as the rainfall is generally sufficient. Farms irrigated, 231,541; acres irrigated, 19,191,716, an increase of 33 per cent in 10 years. In 1921, irrigation was planned for 26,020,477 acres. Total capital invested in irrigation to 1920, $697,657,238. Average investment per acre of enterprises capable of supplying irrigation in 1920, $26.81 per acre. The government's cost for operating and maintenance to June 30, 1921, of the U.S. Reclamation Service, was $15,654,158.54. Revenues, $10,275,219.35. Area irrigated, 1,225,480 acres. Service prepared for 1,661,960 acres. Independent and partnership enterprises, 6,848,807 acres; co-operative, 6,581,400; commercial enterprises, 1,882,041; U.S. Reclamation, 1,254,569; Carey Act, 523,929; U.S. Indian Service, 284,551; all others 53,572. In Mexico plans are made to tap several rivers to supply irrigation. Spain, another dry country, has started irrigation systems, using the Ebro and Daro rivers. Australia is tapping and storing the water of the Murray River. In the Philippines, irrigation projects will provide irrigation for 300,000 hectares of land. See RECLAMATION.

IRULAS, tribe of the Nilgiris, India, numbering *c.* 80,000.

IRUN (43° 21′ N., 1° 47′ W.), town, Guipúzcoa, Spain, on Bidassoa; ironworks. Pop. 10,000.

IRVINE (55° 36′ N., 4° 39′ W.), royal burgh and seaport, on river Irvine, Ayrshire, Scotland; chemical works; foundries. Pop. 10,180.

IRVING, EDWARD (1792-1834), Scot. preacher; *ed.* at Edinburgh Univ.; teacher at Haddington and Kirkcaldy; obtained a preaching license, 1815, went to Edinburgh, 1818, and to the Caledonian Church, London, 1821; founded the *Catholic Apostolic* or *Irvingite Church*, in 1832.

IRVING, SIR HENRY (1838-1905), Eng. actor. His real name was John Henry Brodribb. He made his first public appearance in Sunderland, 1856, as 'Gaston' in *Richelieu*, and acted for two years in Edinburgh. In London he arrested the attention of the critics as 'Rawdon Scudamore' in *Hunted Down*. His real fame dates from his engagement with Bateman at the Lyceum, in 1871, his association with that theatre lasting for upwards of thirty years. In his performace of 'Mathias' in *The Bells* he secured a strong hold on the theatergoing public; his appearance as 'Hamlet' stamped him as a Shakespearean actor of rare distinction. In 1878, he became lessee of the Lyceum, and his association with Miss Ellen Terry did much to ensure the success of the enterprise.

IRVING, HENRY BRODRIBB (1870-1919), Eng. actor-manager; eldest *s.* of Sir Henry Irving; formed company of his own with Miss Dorothea Bairds, his wife as his leading lady; toured Britain and U.S., afterwards becoming lessee of Shaftesbury Theater, 1908, and of Queen's Theater, 1909-11; toured Australia, 1911-12, and S. Africa, 1912-13; was lessee of Savoy Theater, 1913-19.

IRVING, ISABEL (1871), actress; *b.* at Bridgeport, Connecticut, 1887; made debut as actress with Rosina Vokes Company as 'Gwendolyn Hawkins,' in *The Schoolmistress*; 1888-1894, with Augustin Daly's Company; for several years leading woman for John Drew, and at Lyceum Theater, New York; played leading roles in England; at Knickerbocker Theater, New York, played 'Lady Jocelyn Leigh' in *To Have and To Hold*; starred under management of James K. Hackett; 1905, played 'Louise' in *The Two Orphans*, 1906, *The Toast of the Town*; 1913, *The Mollusc*; 1916-1917, *The Merry Wives of Windsor*; 1917, *Mistress Page*; 1921, *A Bachelor's Night*.

IRVING, MINNA (Mrs. Harry Michener), writer; *b.* at Tarrytown, New York. Educated by private tutors; studied music in Rome. Author of *Songs of a Haunted Heart*; *A Cunning Culprt*; *Marriage of the Future*; writes verse for magazines and newspapers; sketches and stories of the sea; 1899, presented with gold medal by survivors of the battleship Maine for her writings on its destruction.

IRVING, WASHINGTON (1783-1859), American author; *b.* in New York, April 3, 1783; *d.* at Tarrytown, New York, November 28, 1859. The *s.* of an English mother and a Scotch father, he was educated at small schools and entered a law office at 16. In 1802, he was a clerk for Josiah Ogden Hoffman, for whose *dau.* Mathilda he cherished a lasting affection, and her death, in 1809, left a memory never effaced. Before he was 20, he was writing for his *bro.'s* paper the *Morning Chronicle*, under the pen-name of 'Jonathan Oldstyle.' In 1804, he went to Europe for his health, spending over two years in travel, and meeting

many notable people. Returning to America, he was admitted to the bar, in 1806, but his chief interest lay in literature. With his *bro.* William and James K. Paulding he conducted a periodical, *Salmagundi*, modeled after *The Spectator*, which ran for 20 numbers. The publication of *A History of New York by Diedrich Knickerbocker*, in 1809, established his fame at home and abroad among all classes of readers. In the following year he gave up law and was a partner with his *brothers*, who had established a commercial house in Liverpool. He went to England, in 1815, in the interests of the business, which failed in 1818. He now devoted himself entirely to literature, and wrote *The Sketch Book*, 1819-1820; *Bracebridge Hall*, 1822; *Tales of a Traveller*, 1824; diplomatic service in Spain, 1826, 1829; *Life and Voyages of Columbus*, 1828; Secretary of Legation in London, 1829-1832; an extensive tour through the W. resulted in *A Tour of the Prairies*, 1835. Having bought an old Dutch house near the scene of *Sleepy Hollow*, at Tarrytown-on-the-Hudson (part of it became Irvington), he named it 'Sunnyside,' and made his home there. He was U.S. Minister to Spain, 1842-1846, and made a study of Arabian history, producing *Mahomet and his Successors*, 1849-1850. His other works are: *Conquest of Granada*, 1829; *Voyages of the Companions of Columbus*, 1831; *The Alhambra*, 1832; *Legends of the Conquest of Spain*, 1835; *Recollections of Abbotsford and Newstead Abbey*, 1835; *Astoria*, 1836; *Adventures of Captain Bonneville*, 1837; *Wolfert's Roost*, 1855; *Life of George Washington*, 1855-1859; and *Biographies of Goldsmith*, 1849; and *Margaret Miller Davidson*, 1841.

IRVINGTON, a city of New Jersey, in Essex co. It is a suburb of Newark, which it adjoins. Its industries include smelters, foundries, and automobile works, iron refineries, etc. The public buildings include a hospital, Elks Home, Bethany Home, and a town hall. There is also a public park. Pop. 1920, 25,466.

IRVINGTON, a town of New York, on the Hudson River, and on the New York Central Railroad. It is chiefly a suburb of New York City. It is named from Washington Irving. Pop. about 5,000.

IRWIN, INEZ HAYNES (1873), auth. *b.* at Rio de Janeiro, Brazil; 1897-1900, at Radcliffe College; 1916-1918, in Europe as correspondent for various magazines; writes for American and English magazines; founder, with Maud Wood, of National College Equal Suffrage League. Author of: *June Jeopardy*, 1908; *Maida's Little Shop*, 1910; *Phoebe and Ernest*, 1910; *Janey*, 1911; *Phoebe, Ernest and Cupid*, 1912; *Angel Island*, 1914; *The Ollivant Orphans*, 1915; *The Californians*, 1916; *The Lady of Kingdoms*, 1917; *The Happy Years*, 1919; *The Native Son*, 1919; *The Story of the Woman's Party*, 1921; *Out of the Air*, 1921; *Maida's Little House*, 1921.

IRWIN, MAY (1862), Amer. actress; *b.* in Whitby, Ontario, Canada. She made her first stage appearance at the Adelphi Theater, Buffalo, in February, 1876. With her *sister*, Flora, she was a member of Tony Pastor's Company in New York, and tours across the continent. For a short time she was a member of Augustin Daly's Company. She acted in *The Junior Partner*, *The Wedding Day*, etc., under the management of Charles Frohman, and supported James Powers in *A Straight Tip* and Peter E. Dailey in *A Country Sport*. For some years she starred in *The Widow Jones*, *Courted into Court*, *Sister Mary*, *Getting a Polish* and other plays.

IRWIN, WALLACE (1876), Amer. author and journalist; *b.* in Oneida, New York. He graduated from Stanford University, in 1899, and began journalistic work as a special writer for the *San Francisco Examiner*. Editor, *The Overland Monthly*, 1902; Burlesque writer for the Republic Theater, San Francisco, 1903; Topical verse writer for the *New York Globe*, 1905-1906; on the staff of *Collier's Weekly*, 1906-1907. Publications: *The Love Sonnets of a Hoodlum*, 1902; *Rubaiyat of Omar Khayyam, Jr.*, 1904; *Nautical Lays of a Landsman*; *The Sign of the Dollar*, 1904; *Chinatown Ballads*, 1905; *Letters of a Japanese Schoolboy*, 1907; *Mr. Togo, Maid of All Work*, 1913; *Venus in the East*, 1918; *The Blooming Angel*, 1919; *The Suffering Husband*, 1920; and *Seed of the Sun*, 1921

IRWIN, WILLIAM HENRY (WILL IRWIN), (1873), an American writer; *b.* in Oneida, N.Y.; *b.* of Wallace Irwin. He graduated from Stanford University, in 1899. He served on the staff of many important papers and periodicals. During the World War he was correspondent in Europe for the *Saturday Evening Post*. He served also as chief of the foreign department of the Committee on Public Information. He was the author of many magazine stories, articles, and several books.

ISAAC, Bible character; only *Child* of Abraham and Sarah, and *f.* by Rebecca of Esau and Jacob. Abraham's faith was tried by being bidden to slay him. Christ was his antitype, and he was held up as a model by St. Paul (*Hebrews II*).

ISAAC I., COMNENUS (*d.* 1061), East Rom. emperor, 1057-59, and founder of dynasty of the Comneni; made important reforms.

ISAAC II., ANGELUS (*d.* 1204), E. Rom. emperor; defeated Normans in Sicily; obstructed Third-Crusade; deposed and blinded by his *bro.*; illustration of Byzantine decadence and vice.

ISAAC OF ANTIOCH (fl. V. cent.). writer to whom are ascribed nearly 200 eloquent didactic sermons in meter in the Syrian tongue.

ISABELLA (1451-1504), Queen of Castile and Leon, 1474; *wife* of Ferdinand V. of Aragon. Her *f.* and *m.* were both descendants of John of Gaunt of England. She sympathized with Columbus' ambitions, and is said to have pawned her jewels to provide funds for his first journey to America.

ISABELLA II. (1830-1904), Queen of Spain; succ., 1833; her *uncle*, Don Carlos, disputed her right, and her reign was marked by plots and intrigues; abdicated, 1870.

ISABELLA, or ELIZABETH, OF BAVARIA (1370-1435), Queen of France; wife of Charles the Mad, 1385; misruled the kingdom, which she granted to England at Troyes, 1420.

ISABELLA OF HAINAULT (1170-90), Queen of France, who brought Artois to the Crown.

ISABEY, JEAN BAPTISTE (1767-1855), Fr. miniature painter of First Empire; one of greatest masters of this art.

ISÆUS (fl. 365 B.C.), Attic forensic orator; pupil of Lysias and teacher of Demosthenes; first speech written about 389 B.C.; continued in his profession for about thirty-six years; specially noted for skill in inheritance cases. Twelve of his speeches are still in existence, eleven concerning inheritance suits; less graceful in style than Lysias, but more logical in reasoning, though inferior to Demosthenes.

ISAIAH, the greatest of the old Testament prophets; received the call *c.* 740 B.C., and *d.* some time after 701. His book has given rise to a great theological and critical lit. It is not one continuous work, but a collection of prophesies of varying date. Large portions of chaps. 1-39 are the work of I. himself. But it is now universally held that chaps. 40-66 date from after the return from exile, and were written therefore *c.* 540 B.C.; chaps. 60-66 may be later still—V. cent. B.C.—while Kenneth would date considerable portions of the whole book in the II. cent. Its hist., spiritual, and theological importance is as great as that of any Old Testament book.

ISAIAH, ASCENSION OF, apocryphal work, dating in present form from probably about A.D. 200. R. H. Charles, who has thoroughly examined it, believes it made up of (1) *Martyrdom of Isaiah*, (2) *Testament of Hezekiah*, (3) *Vision of Isaiah*. Written in Gk.; (2) possibly in Semitic; these three probably written end of I. cent.

ISANDHLWANA, ISANDULA (28° 24′ S., 30° 38′ E.), hill, Zuzuland, South Africa; scene of memorable Brit. disaster in Zulu War, 1879.

ISAR (48° 36′ N., 12° 19′ E.), river, Bavaria, Germany; ancient *Isarus*; rises in Tyrol; joins Danube near Deggendorf; length, *c.* 200 miles.

ISAURIA (37° 20′ N., 32° 10′ E.), ancient district, Asia Minor, on N. slope of Taurus; seat for cent's of a race of robbers who, defeated successively by Servillus and Pompey, remained still barbarous and unsubdued.

ISCHIA (40° 44′ N., 13° 55′ E.), isl. of Italy, W. of the Bay of Naples; of volcanic origin; very fertile; wine, fruit, oil, and corn produced; has warm mineral baths; chief towns, Ischia and Casamiccola; visited by earthquakes in 1881 and 1883. Pop. 28,000.

ISCHL, BAD ISCHL (47° 44′ N., 13° 37′ E.), watering-place, Austria, at junction of Traun and Ischl; brine and other baths; important center of salt industry. Pop. 11 000.

ISEGHEM (50° 55′ N., 3° 12′ E.), town, W. Flanders, Belgium, linen; lace, tobacco. Pop. 12,172.

ISEO (45° 45′ N., 10° 3′ E.), lake, Lombardy, Italy, traversed by the Oglio; length, *c.* 15 miles; ancient *Lacus Sebinus*.

ISÉRE (45° 25′ N., 5° 25′ E.), department, S.E. France, formed from part of ancient Dauphiné; surface mountainous; chief rivers, Rhône and Isère; produces wheat, wine, fruit; coal and iron worked; manufactures gloves; paper, iron, and steel goods; chief town, Grenoble. Pop. 1921, 525,522.

ISÉRE (45° 2′ N., 10′ 5° E.), river, S.E. France; traverses Savoy and Dauphine; joins Rhône six miles N. of Valence; course, *c.* 180 miles.

ISERLOHN (51° 23′ N., 7° 42′ E.), town, Westphalia, Germany, on Baar; iron and steel works. Pop. 31,294.

ISHMAEL (Book of *Genesis*), *s.* of Abraham and Hagar; an 'ethnic' name —*Ishmaelites*, tribe to whom Israelites were akin.

ISHPEMING, a city of Michigan, in Marquette co. It is on the Chicago and Northwestern, and the Duluth, South Shore and Atlantic, and other railroads. It is the chief mining center for the great Marquette Iron Range and the surrounding country contains many of the most productive iron mines in the world. In addition to the mines and iron works, there are also manufactured boilers, wagons, and lumber. The city is connected by electric railways with neighboring towns. It has a public library and a national park. Pop. 1920, 10,500.

ISHTAR, ISTAR, Babylonian and Assyrian goddess, worshipped in Phœnicia as Astarte.

ISINGLASS, the cleaned, dried swimming bladder of fish, that from sturgeon being most valuable; uses are to clarify beer and wine by mechanical precipitation of particles, and to give lustre to silk.

ISIS, Egyptian goddess; wife of Osiris; often represented with her *s.* Horus in way suggestive of Virgin and child; her worship spread to Greece and Rome and was powerful rival of Christianity; her sacred animal was the cow.

ISKELIB (40° 45′ N., 34° 10′ E.), town, Angora, Asia Minor. Pop. *c.* 15,000.

ISLAM (Arab. 'obedience,' 'pious'), name applied to the Mohammedan religion from its salient trait, resignation to will of Allah.

ISLAMABAD (33° 43′ N., 75° 17′ E.), town, Kashmir, India, on Jhelum; cotton and woolen goods. Pop. 9,500.

ISLAND, a piece of land wholly surrounded by water, originating either by submersion of connecting portion of mainland, or volcanic upheaval of parts of the ocean bed.

ISLE OF FRANCE, former name of *Mauritius*.

ISLE OF MAN. See MAN, ISLE OF.

ISLE OF PINES. See PINES, ISLE OF.

ISLE OF WIGHT. See WIGHT, ISLE OF.

ISLES OF THE BLEST, or FORTUNATE ISLANDS (classical myth.), islands inhabited after death by those who received immortality; sought for in Atlantic between Portugal and the New World by navigation of the Renaissance.

ISLINGTON (51° 33′ N., 0° 6′ W.), metropolitan bor. and par., London, England, two miles N. of St. Paul's. It contains Agricultural Hall, where national horse and cattle shows take place annually, the metropolitan cattle-market, the London Fever Hospital, Holloway and Pentonville prisons, etc. Pop. 327,400.

ISLIP, a town in New York, in Suffolk co. It contains a village of the same name on Great Suffolk Bay. It has a large trade in fish and oysters and is a favorite summer resort. Pop. about 25,000.

ISMAIL PASHA (1830-95), khedive of Egypt; *grandson* of Mehemet Ali; made Egypt virtually independent of Sultan of Turkey, who acknowledged him as khedive, 1873; engaged in internal reforms and great public works, chief of which was construction of Suez Canal; became so involved in debt that he sold his shares in Canal to Brit. Government; compelled to abdicate by France and Britain, 1879.

ISMAILIA (30° 40′ N., 32° 20′ E.), town, Lower Egypt on Lake Timsah, Suez Canal; founded 1863. See also GONDOKORO, ISMAIL. Pop. 10,000.

ISMID (40° 45′ N., 29° 57′ E.), town, on Gulf of I., Asia Minor; seat of Gk. and Armenian abp's; ancient *Nicomedia*. Pop. *c.* 20,000.

ISOBARS, lines joining places which have same barometric pressure. See METEOROLOGY AND CLIMATIC CHARTS.

ISOCHRONISM (Gk. *Isos*, equal, and *Chronoc*, time), property possessed by pendulum when its oscillations large, and small, are performed in equal times; this occurs only when it moves in a cycloid arc.

ISOCRATES (436-338 B. C.), Gk. orator; friend of Plato, who highly esteemed his talent for rhetoric and philosophy; *b.* at Athens; ed. by Socrates and several of best-known Sophists. Most of his speeches were published as pamphlets, as weakness of voice prevented his appearance in public as an orator; he gave lessons in oratory at Chios, and later at Athens, many well-known writers and orators being among his pupils (*e.g.*, Isæus, Lycurgus, Timotheus, Æschines). For a few years he adopted the profession of speech-writing, but in this he was less successful than as a teacher. In politics he aimed at uniting all Greece against Persia, and late in life he appealed to Philip of Macedon to lead the Greeks against Persia; subsequently hearing of Philip's victory over the

Athenians at *Chæronea*, he starved himself to death. His writings include the *Panegyricus* (written *c.* 380 B.C.), exhorting Athens and Sparta to take the lead against Persia, and the *Philippus*, the afore-mentioned appeal to Philip of Macedon, the *Areopagiticus*, and other political works.

ISOGONIC. See MAGNETISM (TERRESTRIAL.)

ISOHYETOSE. See CLIMATIC CHARTS.

ISOLA DEL LIRI (41° 40′ N., 13° 34′ E.), small town on Liri, Caserta, Italy. Pop. 8,700.

ISOMERISM (chem.), is the phenomenon seen when compounds occur having the same molecular formula but different constitutions. Such compounds are called *Isomers* or *Isomerides*, and they differ in the arrangement of their atoms. For every possible arrangement of atoms with a given *valency*, there is a *Graphic Formula* representing an isomer. Thus supposing carbon to be tetravalent, the hydrocarbon butane with the molecular formula C_4H_{10}, can be represented by two graphic formulæ. There should be and there are two isomers. The number of possible isomers increases with the number of carbon atoms in the molecule —*Optical*, *Physical*, or *Stereo-Isomerism*: these isomers have the same graphic formula, but they differ in their action on polarised light and in certain physical properties. Such isomerism occurs only in substances which have a carbon atom combined directly with four different groups (asymmetric carbon atom).

ISOPLEURA, sub-class of GASTEROPODA.

ISOPODA, the name of an order of Malacostracan crustaceans, characterized by a broad, flattened body, with no carapace, and by lamellar legs, whose inner rami serve as branchiæ, situated on the abdomen. They have many features in common with the Amphipoda, as, for instance, the sessile eyes and the firm, calcareous covering of the body, but the abdomen of I. is usually much shortened and the heart is situated posteriorily. Some of the larger species inhabit the bed of the sea, others are inhabitants of fresh waters, and many are parasitic on the bodies of fishes and crustaceans. I. are divided into two sections: under I. Genuina are grouped Oniscoidea, woodlice, the only terrestrial forms, Asellota, Phreatoicidea, Valvifera, Flabellifera, and Epicaridea.

ISOTHERM. See METEOROLOGY AND CLIMATIC CHARTS.

ISPAHAN, ISFAHAN (32° 41′ N., 51° 52′ E.), province and town, Persia. Province bounded N. by Kashan, Natany, and Irak, E. by Yeyd, S. by Fars, W. by Bakhtiari district and Arabistan; mostly fertile country, producing quantities of rice, wheat, barley, cotton, opium, and tobacco. Town, once capital of Persia, situated on the Zāyendeh River, surrounded by beautiful orchards, avenues, and fields; formerly magnificent city of great importance, now practically in ruins, with deserted streets and dilapitated houses. Pop. 75,000.

ISRAEL, name given to Jacob after his wrestle with the angel (*Genesis* 32^{28}); 'Children of I.' shows mixed patriarchal and theocratic elements in early chief of a tribe. See JEWS.

ISRAELI, ISAAC BEN SOLOMON (*c.* IX. and X. cent's), Jewish physician and philosopher; flourished in N. Africa; author of medical and philosophical works in Arabic, later trans. into Latin.

ISRAELS, JOSEF (1824–1911), Dutch painter; *b.* at Groningen, June 27, 1824; *d.* in 1911. He studied under Kruseman in Amsterdam, and Picot in Paris. His first efforts in historical painting were not entirely successful, and he turned to scenes of humble life and was especially noted for studies of fishermen at work. A number of his paintings are in the art galleries of the United States. *Expectation* and *A Frugal Meal* are in the Metropolitan Art Museum, New York; *A Dutch Interior* in the Walters Collection Baltimore. Other distinctive painting by him are: *The Silent House*, *Alone in the World*, *A Son of God's People*, *Children of the Sea*, *The Zandvoort Fisher*, and *Toilers of the Sea.*, regarded as his finest work. He published a volume of his travels in Spain, *Spanien*, *1900*. His work has been compared in technique to Millet.

ISSACHAR, tribe of Israel named from Jacob's ninth *s.*

ISSEDONES, extinct Asiatic tribe of cannibals mentioned by Herodotus.

ISSOUDUN (46° 57′ N., 2° E.), town, Indre, France; textiles, agricultural implements. Pop. 14,200.

ISSUS, ancient city, Cilicia, Asia Minor; scene of victory of Alexander the Great.

ISSYK-KUL (42° 30′ N., 77° 30′ E.); lake, Central Asia; area, *c.* 2,200 sq. m.

ISTHMUS, a narrow neck of land connecting two larger portions of land, *e.g.* I. of Corinth, I. of Panama.

ISTRIA (45° 20′ N., 13° 55′ E.), Italy, forming a peninsula in N.E. of Adriatic; generally mountainous; produces fruit and wine. Pop. 405,000.

ISVOSKY, BARON (1858-1917), Russian statesman; entered the Foreign Office at an early age and soon earned promotion; sent first to Rome, then to Tokio and Copenhagen; minister of foreign affairs, 1906-10; negotiated the Anglo-Russian Convention, 1907; prominent in the Balkan crisis, 1908; Russian ambassador to France, 1910-17. His *Memoirs*, only a fragment, pub. in English, 1920.

ISYLLUS, Gk. poet of Epidaurus (fl. IV. or III. cent. B.C.); name and inscription alone commemorate his existence.

ITALIA IRREDENTA, 'Unredeemed Italy,' embraces those districts out of Italy where Ital. speech prevails, such as S. Tyrol, Trentino, Trieste, and Istria. These territories were awarded to Italy in 1919, by the Treaty of St. Germain. See ITALY.

ITALIC, term applied to Composite order of architecture; also to a Lat. edit. of the *Bible*; Italian as distinguished from 'Roman'; kind of type *e.g. Italic*.

ITALY, a kingdom in S. Europe (34° 40′—46° 40′ N., 6° 25′—18° 30′ E.), *c.* 700 m. long, and the peninsula of which it mainly consists varies in breadth from 100 to 150 m. It is bounded on N. by the long chain of the Alps, and is therefore a natural besides a political entity; only on N.E. is the boundary artificial. The islands of Sicily, Sardinia, Elba, and *c.* seventy small ones belong to Italy. The N. (Lombardy) is largely the basin of the Po, which has many tribs. Just N. of the mouth of the Po is that of the Adige, on one of the lagoons of which stands Venice. The long chain of the Apennines, a continuation of the folded Alps, runs through the peninsula from the N.W., where it fringes the beautiful coast strip known as the Riviera. The Apennines spread out into a number of ranges in Central Italy, and have thus broken up the country and facilitated political disunion. The climate of this central part varies considerably, for the higher land is bleak, while the valleys are warm and comparatively luxuriant. The two rivers of Central Italy are the Arno and the Tiber; on the former stands Florence, on the latter Rome, and the country they flank is volcanic. The Po is the only Ital. river that surpasses the Arno in size. S. of Rome is the Campagna, an open plain. S. Italy is mostly broken up, particularly Calabria, but here there are no rivers of importance. The only important lakes in Italy are those in the N. The Lake of Garda is the biggest, that of Maggiore is the longest, 37 m. Como has a depth of over 1,300 ft. See Map of Italy.

The Ital. climate varies greatly in different places and in different times of the year. Summer heat in the N. is as great as in the S. of Italy, but in winter it is as cold as N. Europe. Oranges and lemons grow on the coast of Calabria, but a few miles inland the climate more resembles that of England. The great scourge of the S. is malaria, and parts formerly inhabited are now dreary wastes. Malaria is, however, being reduced; pellagra is prevalent. Earthquakes at intervals convulse the S. (especially Calabria and Sicily); Vesuvius and Etna are active volcanoes.

Resources and Industries.—Agriculture is the principal industry; chief crops of N. are maize and rice; of S., wheat, olives, oranges, lemons, chestnuts, almonds; flax and hemp are grown, and tobacco is under state control. Cheese of Gorgonzola is famous. Manufactures are silk and cotton in N., woolens, furniture, glass (at Venice), porcelain, beetroot sugar, olive oil, paper. Coral and tunny fishing employ over 26,000 fishermen. Minerals are plentiful, sulphur-ore working employs more laborers than any other mineral; lead and zinc are important; coal, iron, mercury, antimony, gold, silver, manganese, and copper are found. Carrara and Massa produce marble. The state owns about three-fourths of the 12,213 m. of railway, the post-office, and telephones; shipping tonnage over 1,000,000. The exports in order of value are raw silk, cotton, manufactured silk, olive oil, wines, cheese, dried fruits, hemp, hides, eggs, acid, fruits, sulphur, flour, wheat pulp, etc.; principal imports are cereals, coal and minerals, silk, cotton.

Education.—Education is under state control, and the cost is borne partly by local authorities, partly by the state itself. The proportion of the population which remains illiterate is steadily decreasing. In 1871, it was 73 per cent; in 1921, only 54 per cent. Illiteracy is greatest in the S. provinces.

Libraries.—Italy is very rich in libraries, particularly those containing rarities. The Vatican Library is one of the most valuable in the world, and is particularly strong in Biblical and other MSS. The archives of the Vatican were thrown open for research by Leo XIII.

Religion.—The religion of Italy is Roman Catholic, less than three per cent of the total pop. belonging to other religions; there were then *c.* 65,000 Protestants, a few members of the Gr. rite of the Roman Church, some of the Gr. Orthodox Church, and about 40,000 Jews.

Area and Population.—By the Treaty of Versailles, 1919, Italy gained the Trentino (*c.* 4,000 sq. m.) and Trieste (*c.* 1,000 sq. m); N. Albania has been handed over to Italy under mandate of the League of Nations. Total area now *c.* 116,000 sq. m., with an estimated pop., 1919., of 37,500,000. Rome is the cap.

Overseas Possessions.—The Ital. kingdom includes Eritrea, and also part of Somaliland in Africa, and the town of Tien-tsin in China. In 1911, Italy invaded Tripoli, and by Peace of Lausanne, Oct., 1912, secured Tripoli and Cyrenaica from Turkey. Total area, *c.* 610,020 sq. m.; pop. 1,467,000.

Constitution. — The government of Italy is a constitutional monarchy, the legislation being shared by monarch with the two houses. The Chamber of Deputies contains 510 members elected by adult manhood suffrage for five years. The Senate contains 385 members, nominated for life by the king; it includes a prince of the blood royal, and the rest are chosen for eminence in politics or other walks of life.

The official relations with the Vatican are of considerable importance. When the temporal monarchy of the Papacy was abolished, in 1870, the Vatican and the Lateran Palaces, St. Peter's and the Papal villa at Gandolfo, were left in the absolute possession of the Pope, and outside Ital. territory. The Pope is given sovereign honors, and the diplomatic corps of the Vatican enjoys the same privileges as that of the Quirinal. A certain sum is granted every year to the Pope. The only other state within a state in Italy is the republic of San Marino.

Defence—Army.—The Ital. army is recruited by conscription, but many are dismissed as physically unfit; some, whose families are dependent on them, are exempted, while others again are chosen by lot to serve for a shorter time. The full training begins at nineteen and lasts nineteen years; army on peace footing is 310,000 all ranks. During World War, 5,250,000 men were in army; loss in killed and missing, 469,000.

Navy.—The Ital. navy has a peace strength of 40,000 of all ranks. War vessels include 11 battleships, 5 armored cruisers, 30 destroyers, with torpedo boats and submarines. Spezia and Pola are fort. naval ports.

History—Ancient Times.—Until the XIX. cent. Italy was never a political unity, but either a number of states and peoples or a member of a larger whole—the Roman Empire. The name Italy was applied by the Greeks to a district in the S.—only later to the whole peninsula. Early history is obscure, but ethnology and archæology afford us some glimpse of her condition, and fairly reliable maps have been constructed showing her as she was—say, in 500 B.C. The greater part of the peninsula was occupied then by the 'Italic' branch of the Aryan, or at any rate, Aryan-speaking peoples. These, however, can be subdivided into the Latin on the one hand, and the Oscan, Volscian, and Umbrian on the other. These last three are really Sabine, or, as some modern scholars prefer, Safine. This is a linguistic classification, but also ethnological.

Rome was a Lat. community, though not the earliest town founded, according to tradition, which is probably correct. The early history of Rome is much obscured by myth, but it is probable that an originally pure pop. (the patricians) won the supremacy over a mingled 'plebian' pop. There was probably a Sabine element in early Rome. In the N.E. of Italy dwelt the Veneti; they and the Iapygians in the S.E. were probably of Illyrian stock—speaking an Aryan but hardly an Italic language. In Sicily there were Siculi and Sicani, one probably, the other possibly, Italian, and Phœnician traders had settled in the towns on the coast; there were also the remnants of a strange people called the Elymi. Gr. settlers, too, were a most important factor in primitive Italy from about the VIII. cent. B.C. onwards, and part of the S. was called Magna Græcia. A great part of N. Italy and one or two isolated districts farther N. were held by the Etruscans, one of the most interesting peoples of the anc. world, over whose linguistic and ethnological affinities there has been much dispute. It seems certain, however, that they were not Aryan. The remains of their language have never been properly deciphered. Their power reached its greatest *c.* 500 B.C. and then declined. N. of the Etruscans and all over the valley of the Po were the Gauls, who swooped down to sack Rome, 390 B.C. E. of them, around what is now now the Gulf of Genoa, dwelt the Ligurians, again a people of disputed race—certainly different from the Etruscans. See ETRURIA.

Thus anc. Italy was made up of a number of diverse peoples who were ultimately welded together under the sway of Rome. The stages of this process really belong to Roman history (see ROME). The influx of barbarian tribes on the collapse of the empire brought a further infusion of diverse peoples, and this lack of homogeneity of race, together with geographical and political circumstances, was largely responsible for the subsequent divisions.

Under the empire, Cisalpine Gaul (N. Italy S. of the Alps) was a prov.—hence Italy meant something smaller than it

ITALY
Scale of Miles
0 10 20 30 40 50 100
Railroads
Size of type indicates relative importance of places
A U S T R I A
SWITZERLAND
ZURICH
Innsbruck
Klagenfurt
Gratz
Bruck
Udine
Trieste
Gulf of Venice
Chioggia
Parenzo
Fiume
Ljubljana
Laibach
Zagreb (Agram)
Karlovac
Sisak
Sulpeter
Bihac
Sanialuka
Vrbanik
Dervis
Sarajevo
Imotski
Mostar
Trebinje
Ragusa
Knin
LUNGA OR GROSSA I.
Sebenico
Spalato
Solta I.
Brazza I.
LESINA
CURZOLA I.
MELEDA I.
PELAGOSA I.
PIANOSA I.
TREMITI IS.
Ravenna
Rimini
Ancona
Pesaro
Fano
Sinigaglia
Leghorn
Pisa
Florence
Siena
Perugia
Foligno
Spoleto
Terni
Rieti
Aquila
Pescara
Chieti
Teramo
Ascoli
Macerata
Genoa
Milan
Parma
Modena
Bologna
Ferrara
Mantua
Verona
Brescia
Bergamo
Como
Lugano
Chiavenna
Bormio
Trent
Bolzano
Meran
Brixen
Innsbruck
Landeck
Lake of Constance
Chur
Lucerne
Bern
Neuchatel
Soleure
Basle
Colmar
Strasburg
Metz
Nancy
Dijon
Besançon
Lyons
Grenoble
Chambery
Turin
Coni
Nice
Monaco
Mentone
Ventimiglia
Oneglia
Savona
Alessandria
Novara
Vercelli
Ivrea
Aosta
Susa
Pinerolo
Mont Cenis
Mont Blanc
Mont Rose
Simplon
Great St. Bernard
Little St. Bernard
Mont Iseran
Mont Pelvoux
Mont Viso
Col de Tende
Col de Larche
Col de Argentiere
Col de Cabre
Col de Genevre
Col de Montgenevre
Col de Clapier
Col de Fenestrelle
Col de Ferret
Col de Balme
Col de Seigne
Col de Bonhomme
Col de Tarentaise
Col de Mont Cenis
Col de Mont Iseran
Col de Mont Pelvoux
Col de

does for us. The reorganization of the country was taken in hand by the Emperor Augustus.

Middle Ages.—In A.D. 476, the separate W. Roman Empire came to an end, and though the empire continued in the E. for nearly a thousand years, and even in the W. recovered some of its territory in the next cent., under Justinian, in 476 Italy fell under the rule of a barbarian and alien, and by foreigners she was ruled for many centuries to come. Odoacer became king, but his reign did not last long, for in 488 Theodoric, King of the E. Goths, was ordered by the Emperor Zeno to subdue Italy. This he succeeded in doing by 493. He was in many ways a fine man, but an Arian, and this proved a hindrance to his power. Under Justinian Italy was invaded, and after a struggle of some years the Gothic kings came to an end in 553. Another Germanic invasion soon followed, for in 568 the Lombards came down into the valley of Po; the Lombard king Albion made Pavia his capital. The Pope, alarmed at this new power, called in the aid of the Frank. This is the first instance of a continued policy of disaster— the tendency of Ital. rulers to apply for foreign help against other powers in the peninsula. The immediate result of this was a firm alliance between the Franks and the Papacy, and the 'Donation of Pepin,' the founding of the temporal possessions of the Papacy, in 756. Meanwhile much of S. Italy continued to belong to the Byzantine Empire, and the Lombard duchy of Benevento still survived.

A new epoch begins in Ital. as in general European history with the Frank kings and the assumption by them of the imperial title. Displacing the feeble Merovingian dynasty in the VIII. cent., they started on a career of conquest which culminated in the coronation of Charles the Great as Emperor of the Romans by Pope Leo III., in 800. But the exact powers of Pope and Emperor were not stated—a fact which led to future difficulties, for at the time each wanted the help of the other. The new empire, however, soon fell to pieces, and it finally came to an end with the inglorious reign of Charles the Fat in 888. Meanwhile Sicily was a prey to Arab conquerors, and the Byzantine Empire again got a firmer hold in Italy. The political and social disruption of the decaying Karling had its parallel in the terrible degradation of the Papacy in the X. cent. A brighter period began again with the Saxon emperors when Otto the Great assumed the imperial title at Rome, in 962. There was still nominally an Ital. king, Berengar, the successor of the Karling kings, but he was conquered by Otto, and afterwards there was no real kingship till the XIX. cent.

Henceforth the control of the Holy Roman emperors over Italy was but slight, and the states which were to play a prominent part till, only in our own day, Italy became united, now took shape. City life, which was to be such a prominent feature of Ital. life, began to develop, and the lead was here taken by Milan. Meanwhile a new ecclesiastical movement comes into prominence under the monk Hildebrand, who became Pope under the title of Gregory VII., in 1073. He set himself a two-fold task—(1) a moral reformation, particularly enforcing the celibacy of the clergy; (2) taking away from secular princes any control over the Church, particularly in the appointment to benefices. The result was the so-called Investiture Controversy, which ended in a nominal compromise, though the Church really came off victor. Hildebrand also strengthened the influence of the cardinalate in papal elections.

The XI. cent. saw also the advent of the Norman power in S. Italy and Sicily, where Greek, Lombard, and Saracen still contended for power. The Normans first landed in Apulia, 1017; William of Hauteville became Count, 1029; the years 1060-90 were spent in the conquest of Sicily; the title King of Sicily was taken in 1130.

From this time the communes in the N. became more and more important. Some memory of ancient liberties still lingered in Rome, where Arnold of Brescia tried to establish a republic, but without the permanent success of republican institutions in the N. The N. cities provoked the opposition of the Emperor Frederick I. (Barbarossa), but in the long run they maintained their position. Frederick II.'s dominions were torn by the struggle between Empire and Papacy, and each Ital. city was rent by Guelph and Ghibelline factions, though the terms lost their original significance. Frederick II. was a 'brilliant failure,' and had he been able to rule in Italy alone it might have been well.

The XIV. cent. was the culmination of the Middle Ages, and 1300 was the date of Dante's vision. Afterwards all is on the decline, and the 'Babylonish Captivity' of the Papacy at Avignon marked a lowering of papal prestige. The popes were largely, though not entirely, under the influence of the Fr. kings. By the XV. cent. the great Ital. states, which were to last to the middle of the XIX. cent., were fairly marked out. Milan was under the family of the Visconti, who were succeeded by the Sforza. In Florence the Albizzi came into power in a reaction against commercial domination; they were succeeded by the Medici. Venice had lived her life apart from the rest

of Italy, more in touch with the East than with the West. The Venetian constitution is one of the most remarkable in history (see VENICE); the power gradually passed from the hands of the doge to the oligarchy, particularly the 'Council of Ten.' After the fall of Constantinople, in 1453, Venice had to throw in her lot with the Western powers.

The Papacy, after the return from Avignon, became Italian, princes putting secular power and the 'New Learning' of the Renaissance before spiritual affairs.

The kingdom of the Two Sicilies was fought for by houses of Aragon and Anjou.

The Italy of the XV. cent. is displayed in the work of Machiavelli, with its cleverness, brilliance, and political intrigue; there was a revival of learning and artistic splendor, but the general tone alike of private morals and politics was bad.

But the Italy of the Middle Ages had produced one of the sweetest characters known to history in St. Francis, and the glories of Ital. are had never been surpassed. But the moral collapse of the Renaissance would not have been so bad had Italians possessed a sturdier conception of national unity.

Modern History.—At the end of the XV. cent., therefore, Italy was divided against itself and at the mercy of rival foreign conquerors. The Papacy had shared in the splendor and worldliness of the classical Renaissance, and then its prestige in Europe was shaken by the Prot. Reformation. Turk. aggression since the fall of Constantinople, 1453, loomed in the background. The detailed history during the XVI. cent. is very intricate, but certain facts stand out. France ceased to meddle so much in the internal affairs of Italy, and the influence of Spain became predominant. The N. was a cluster of small states. Pope Paul III. (Alessandro Farnese) planted a dynasty in Parma. The Medici still ruled in Florence. Venice and Genoa were the only important republics. Savoy, under its duke, Emmanuel Philibert, 1553-80, was in the ascendant. His family dated from the XI. cent., and in his time Italy really became an Ital. power. Its cap. was moved from Chambrêy to Turin. Venice fell from her great position in the XVII. cent. mainly because of the opening up of new trade routes, and then for the time Italy became involved in the three great wars of the Span. Succession, Polish Succession, and Austrian Succession. After the first, which was brought to an end by the Treaty of Utrecht, 1713, Victor Amadeus of Savoy became King of Sicily, which country was afterwards exchanged for Sardinia. The second, finished in 1738, settled the succession in Parma and Tuscany. After the third had been brought to a close, in 1748, by the Treaty of Aix-la-Chapelle, Milan and Tuscany became Austrian property. Genoa handed Corsica over to France in 1755. The latter part of the XVIII. cent. saw Italy slumbering under several benign despotisms—in some provinces under despotisms not benign, particularly in Naples.

A new era in Italian history opened in 1796, when the country was drawn into the vortex of Napoleonic activity. At that time considerable parts of the country were held by Spain and Austria —by the former the Two Sicilies (a name frequently given to Naples and Sicily together) and Parma; by the latter, Tuscany, Mantua, and Milan. In 1796, a Cispadane Republic was founded at Modena and supported by Bonaparte, and next year a Cisalpine or Transpadane Republic at Milan. In 1798, the Venetian Republic, whose best days had been long since over, was finally crushed and her territory was divided between Austria and France. French troops took Rome, 1798, and next year a Parthenopean Republic was founded at Venice. Then followed the invasion of Italy by the allied Austrian and Russian armies. In 1801, by the Treaty of Luneville, Austria recognized the Ligurian and Cisalpine Republics so long as they were not under France. Meanwhile Napoleon had practical control over most of Italy and was determined to maintain it. In 1803, he was elected President of the Cisalpine Republic, and next year his *bro.* Joseph Bonaparte, took the title of King of Italy. In 1805, he annexed the Ligurian Republic, whereupon Britain, Austria, and Russia combined against France; but after Napoleon's victory of Austerlitz, Austria gave up to France her share of Venetia and some of the Austrian lands along the Adriatic. Still many reforms were carried out by the Fr. rulers of Italy, particularly in the judicial sphere. Joseph Bonaparte exchanged his Ital. kingdom for Spain, in 1808, and Murat was created King of Naples. Meanwhile, Napoleon quarrelled with the Pope and annexed the Papal States.

The Papal States were now under the direct government of Napoleon, and many salutary reforms were introduced; but trade was practically limited to France, and the number of men required for the Napoleonic armies was rather a strain. Napoleon's power in Italy declined after the disaster of the Russian campaign, Austrian forces captured Milan, in 1814, and by the Treaty of Paris, 1814, the *status quo* before the Revolution was restored. Sardinia recovered Savoy and Nice and annexed Genoa; Austria her N. Ital. and Danubian lands. The restoration of the

old régime was received with bitter feeling, particularly in Naples, where the Bourbon government, with its cruelty, bigotry, and incompetence, was deservedly detested.

The period from 1815 to 1870 is often called the *Risorgimento—i.e.*, 'Reawakening.' Austrian influence was predominant, repression provoked inevitable reaction of feeling, and revolutionary societies grew apace.

There was a revolution, for a time successful and then checked, in Naples, in 1820, and another outburst in several parts of Italy, in 1830. The famous Ital. patriot, Mazzini, wrote, in 1831, to Charles Albert of Sardinia, asking him to renovate society, and there were various schemes, some moderate, some extreme, afoot; 1846 saw the death of Pope Gregory XVI. and the election of Pius IX., a well-meaning man of some liberal sympathies, but neither a clear thinker nor a good statesman. He carried through some reforms, but things soon got beyond his control; 1848 was a time of revolutionary agitation all over Europe. In March, there were disturbances in Lombardy, and there was an Ital. alliance against Austria—a war which the Pope, much to his distress, was obliged to sanction. In Aug., there was a truce between Austria and Piedmont, in which the former relinquished Lombardy and Venetia.

There were commotions in Rome. The Pope's authority was defied, and a republic was proclaimed. Ferdinand II., the King of Naples, was deposed, but restored. War broke out again between Piedmont and Austria, and the former was defeated at Novara. Garibaldi took Rome, but was then obliged to flee from the country. Austria won back Venice, and again things became as they were before. For ten years Austria carried out a policy of vigorous repression in Lombardy and Venetia. The great reforming statesman in Piedmont was now Cavour, but he had to bide his time. At last Austria took to milder measures, but in Rome the government remained quite reactionary. A 'Societale Nazionale' was formed which looked to Victor Emmanuel of Piedmont to become the leader of a free and united Italy, though to unite N. Italy was the first step. Victor Emmanuel won the support of the Emperor Napoleon III., and war was declared by France and Piedmont against Austria, in 1859.

But after a time Napoleon backed out and made an agreement with Austria by which Lombardy should be given to Piedmont and Venetia retained by Austria. Tuscany was annexed by Piedmont, and the grand-duke fled. In 1861, Cavour died, and Piedmont was deprived of her greatest statesman at a most critical time. But the new kingdom of Italy was really founded. In 1864, an agreement was arrived at between Italy and France, by which Fr. troops were to be taken away from Rome, and Italy not to move against it within six months. In 1865, the cap. was removed to Florence. An alliance was made between Italy and Prussia against Austria, in 1866, which was followed by war. Austria was defeated and Venetia annexed by Italy. The year 1870 was marked by the meeting of the Vatican Council in Rome, when the doctrine of Papal Infallibility was formulated. In July, Italy went to war with the Papal States, and in Sept., Rome was entered. On Oct. 2, Rome was united to Italy by a popular vote. A law was passed defining the position of the Vatican under the new régime. The relations between the Vatican and the Quirinal have gradually become friendlier, notwithstanding a certain amount of official friction. Meanwhile, the country was in a state of financial exhaustion, and all the energies of the state were required to get the kingdom in a happier condition. On Jan. 9, 1878, Victor Emmanuel died, to the great grief of his people, and was succeeded by his *s.*, Humbert, and on the 28th, Pope Pius IX., who had sent his benediction to the dying king, likewise passed away. In 1882, Garibaldi, to whom the union of Italy owed so much, *d.* In 1887, Crispi came into power, but fell in 1891; when, after a short coalition government, Giolitti came in with a liberal programme, but in defence of monarchical principles. A scandal, however, occurred when it was discovered that several members of the government had had suspicious dealings with the Banca Romana. Crispi returned to power, but in 1896 came the terrible defeat of Adua, in Abyssinia, and a wave of popular fury drove the government from office.

In 1898, there were riots and social disturbances more or less all over Italy, particularly in Milan, followed by military trials and far too rigorous repression. At length there was an amnesty, but many were exempted from it. In 1900, King Humbert was murdered, and his *s.*, Victor Emmanuel III., came to the throne. There were several strikes, partly caused by the more sympathetic attitude of the government to the Labor movement. In 1903, Leo XIII., who had done much to raise the prestige of the Papacy in the world, *d.*, and Guiseppe Sarto, the Patriarch of Venice, was elected under the title of Pius X. In 1904, there was a general strike, and the feeling of the middle classes was roused against the proletariat. The taking over of the railways by the government, in 1905, caused a general

upset of the traffic. The XX. cent. has seen some new forces emerge in Ital. life. Large numbers of the Catholic laity take a moderately conservative line, while, on the other hand, Socialism is a strong and rising force. The pressure of taxation, particularly local, is very great.

Italy's foreign policy has largely been concerned with Africa. From 1884, the government had relations with Abyssinia; in 1895, war broke out and the Ital. army suffered the overwhelming disaster of Adua, in 1896.

Until the advent of the Young Turks to power in Turkey the foreign policy of Italy had been concerned mainly with Austria, her traditional enemy in spite of the Triple Alliance. Now her ambitions for a foothold in N. Africa led her into a conflict with Turkey. An ultimatum to the government at Constantinople announced the intention of Italy to proceed to the military occupation of Tripoli and Cyrene; war was declared on Sept. 29, 1911, and within a week the Tripolitan coast had been blockaded, the port of Tripoli bombarded and captured, an army of 40,000 Italians landed, and a number of small Turk. war vessels sunk. For an account of the ensuing war, see TRIPOLI.

By the end of Dec., 1911, the powers realized that Turk. resistance to the invasion of Tripoli was ineffective, and succeeded in inducing the Ottoman Empire to cede Tripoli and accept an Ital. indemnity. Peace was agreed upon at Ouchy, Switzerland, Oct. 15, 1912, and signed at Berlin, Oct. 18.

During the war the Triple Alliance had been renewed for twelve years after its expiration, in 1914. In this period also Italy became involved with France over the seizure of the Fr. warships *Carthage* and *Manauba*, the former for transporting two aeroplanes to the Turks, and the latter for carrying Turk. officials to Tripoli. Both ships were released when it was proved that the aeroplanes were only for exhibition, and that the officers were members of the Red Crescent Society.

The electoral law of 1912, made universal manhood suffrage effective, only the illiterate with unfinished military service being barred. This increased the electorate from three to eight millions, and the Socialist vote from 329,000 to 825,000.

Scarcely had the country settled down after the brief war with Turkey, than Serbia's ambitions threatened peace. This little Slav kingdom, in Nov., 1912, had announced her intention of securing a port on the Adriatic, and later had taken possession of Durazzo. Serbia being closely allied to Russia, this move threatened Italy's sphere of influence on the Adriatic. Austria-Hungary was also deeply interested, and with Germany, through the Triple Alliance, demanded that the *status quo* on the Adriatic be not disturbed. The autonomy of Albania was declared necessary to the European Concert, and this declararion was accepted by the London Conference, Dec. 20, 1912.

On Aug. 9, 1913, Austria notified Italy of an intended attack upon Serbia, and ordered fulfilment of the pledge of the Triple Alliance. This Italy refused, on the ground that Austria would be the aggressor, and that the Alliance was for defence only. A year later, when the assassination of the Archduke Ferdinand and his wife at Serajevo called forth Austria's ultimatum to Serbia and plunged all Europe into war, Italy took the same stand, refusing to join her allies.

In 1914, serious financial conditions, unemployment, and charges of waste and inefficiency in the Turk. war, caused the downfall of the Giolitti government on March 10, and a new cabinet was formed by Salandra. On April 18, 1915, Italy made a demand upon Austria for the restoration of the boundaries of the Trentino as they existed in 1811, the cession of Gradisca and Gorz (Gorizia), and certain islands, with renunciation of all interests in Albania. For this Italy was to pay 200,000,000 lire, gold, and maintain strict neutrality. The terms were not acceptable to Austria. On May 3, 1915, Italy withdrew from the Triple Alliance, and declared war, May 23, 1915. Simultaneously to her negotiations with the Dual Monarchy, Italy was carrying on pourparlers with the Allies, the outcome of which was embodied in the secret Treaty of London, April 26, 1915, which promised to Italy practically all she had asked from Austria, on condition that she entered the war within one month. For an account of the hostilities, see WORLD WAR.

Reverses in the Trentino, in 1916, resulted in the overthrow of the Salandra minintry, on June 11, and the organization of a coalition ministry, headed by Signor Boselli. War was declared on Germany, Aug. 28. While the new government was much criticised, it maintained itself in power until the second invasion of the Trentino, when it fell, and a new ministry was formed by Vittorio Orlando, Oct. 30, 1917.

The fortunes of war now began to swing from the Central Powers towards the Entente, and Austria came to the verge of collapse. The Czecho-Slovaks claimed independence, and were recognized by Italy at the Pact of Rome, July 1, 1918, in which, by implication, Italy renounced the secret Treaty of London.

Three months later Italy refused to

consider Austria's peace offer, and began the second battle of the Piave, which was rapidly becoming a triumphal march, when, on Nov. 4, 1918, an armistice was signed.

Italy immediately formulated her demands, and presented them to the Peace Conference. Her claims included the Trentino as far as Brenner Pass, all of the S. Tyrol, Trieste, Istria, Fiume, Zara, Sebenico, Dalmatian Islands, Avlona and the Dodecanese Islands in the Ægean. The E. coast claims conflicted with the claims of Jugo-Slavia, and the claims to the Dodecanese Islands with those of Greece.

The dispute with Jugo-Slavia became very bitter. President Wilson stood firmly against the transfer of Fiume to Italy, taking the ground that the surrounding territory was predominantly Jugo-Slav, while Italy rested her claim on the London decree of 1915, which granted her the city, and on the fact that Fiume was predominantly Italian. President Wilson would not yield, and the Ital. delegates withdrew from the Peace Conference and returned to Rome, on April 23. Open rupture was, however, overcome by the return of the Ital. delegates, who offered some concessions—namely, that Fiume be made a free city, willingness to give up a portion of Istria and the Greek-populated Dodecanese Islands. They refused, however, to yield Zara and Sebenico on the Dalmatian coast. The controversy discredited the Orlando government, and on June 22, 1919, Signor Nitti organized a new cabinet, and endeavored to achieve what Sonnino had failed to effect. A new scheme of settlement was drawn up with approval of Italy and forwarded to Washington, Aug. 25, 1919, generally called the Washington Scheme. This provided for a free port area partly in Fiume and partly in Sushak (the Baros port) to be administered for a period of 99 years, Italy to hold the sovereignty, but the League of Nations to administer the railways running into it. A further complication of matters arose when, on Sept. 12, 1919, the Ital. poet d'Annunzio occupied Fiume and proclaimed its annexation to Italy. The Allies left Italy to settle this affair herself. On Nov. 15, d'Annunzio raided Zara. In Dec., negotiations were entered into between the Fiume Council and the Ital. government, the latter pledging itself to accept no solution which did not provide for the independence of Fiume and territorial connection with Italy. On Dec. 9, the representatives of U.S., Great Britain, and France signed a memorandum to be presented to Italy. The points embodied therein were : (1) a modification of the Wilson line, so as to include Albona in Ital. territory; the creation of a buffer state, to include 200,000 S. Slavs as against 40,000 Italians, and the demilitarization of the Assling region. (2) The future of the buffer state to be in the hands of the League of Nations, and not to be determined by plebiscite; Fiume to enjoy autonomy in the buffer state. (3) Zara to be a free city under the League, but within the S. Slav customs union. (4) Italy to have Lussin and Unie, Lissa, and the islets to the W., Pelagosa; these islands to be demilitarized, and Lissa to have complete autonomy. (5) Albania to come under an Ital. mandate; provision for Gr. claims in the S. (6) Valona and necessary hinterland to become Italian. On Jan. 10, 1920, Italy replied to this memorandum. The boundaries of the proposed buffer state were criticized on the ground that they were a danger to Trieste, and, in effect, asking for the boundaries of the Treaty of London, and for the buffer state to be constitued out of territories of the Triune kingdom. She demanded Cherso and the demilitarization of the coast-line as well as of the islands; the proposed S. frontier of Albania was too favorable to Greece. On Jan. 10, M. Trumbitch argued the S. Slav. case at length. The Conference rejected his arguments, and proposed Ital. sovereignty over the *corpus separatum* of Fiume, but modified their proposals, on Jan. 14, where the *corpus separatum* was to be an independent state under the League of Nations; Sushak to go to the Triune kingdom, the port and railways to go to the League of Nations; the railway westward to go to the Triune kingdom, the road to go to Italy; the dist. of Senozziche to go to Italy; the buffer state to disappear; Zara to be a free state; Valona to be Italian; N. Albania to go to the Triune kingdom; Lussin, Pelagosa, and Lissa to Italy; all islands to be demilitarized; economic enterprises to be protected. This ultimatum was disapproved by President Wilson, and after several notes had passed between the Fr. and Brit. allies and President Wilson, the former expressed their willingness to withdraw the memoranda of Dec. and Jan. Negotiations dragged on till the San Remo Conference, in April. Although the question was discussed there, no solution was arrived at except that Italy and Jugo-Slavia were advised to endeavor to come to an arrangement satisfactory to both sides. Representatives of the two nations, therefore, met in conference at Palanza, on Lake Maggiore, early in May, but the meeting had to be suspended, owing to the resignation of the Ital. cabinet. A new ministry was formed by Signor Nitti, in May, but fell early in June, when

Giolitti returned to power. The question was finally settled by the Treaty of Rapallo, which made Fiume a free city and gave Dalmatia to Jugo-Slavia. See FIUME.

The economic conditions of the country, due to conditions left by the war, created, from 1920 to 1922, a situation which rapidly became desperate. The peasants seized many of the landed estates during the summer and autumn of 1920, and the Socialists and Communists organized and seized many of the manufacturing plants in the larger cities. Labor was practically in the control of industry and there were riots, murders, and general disorder was prevalent throughout the country. Bolshevist propaganda was carried on with money supplied from Russia, and a large communist organization was becoming a powerful element in the country. The controversy with Jugo-Slavia in relation to Fiume also continued to disturb the political situation. The government was weak and was concerned chiefly with their ability to preserve their power. There had arisen, however, during 1920, as an offset to the Communist and Socialist propaganda and movement, a voluntary organization known as the Fascisti, under the leadership of Mussolini. (See FASCISTI.) This organization was made up chiefly of members of the middle classes who were being ground between the millstones of officialdom and labor. The movement grew rapidly, and by May, 1920, had organizations in nearly all the towns of S. and central Italy. They took drastic measures, and by force dealt with Communists and Socialists so aggressively that at the end of 1921 they met with little opposition. The government had sunk to a position where it had little power, and in Oct., 1922, by a swift and almost bloodless revolution, the Fascisti, headed by Benito Mussolini (see MUSSOLINI BENITO), seized the government and ousted the ministers. This was done with the consent and approval of the King, who had summoned Mussolini to Rome. He was at once appointed Prime Minister, and became the actual ruler of Italy. General Armando Diaz, the successful leader of the Italian armies of the war, was appointed Minister of War, and the other members of the cabinet were identified with the Fascisti movement. Mussolini at once began the organization of economic and political reforms in which he was heartily supported by the King and the Italian people. He had become now the most conspicuous figure in Europe, and he took an important part in the conferences of Brussels, Lausanne, and London, held in 1922-23. The Fascisti army, which numbered over 100,000 men, was disbanded, but was at all times ready to assume the aggressive.

In September, 1923, as the result of the murder of five Italian officials in Albania, Italy seized the island of Corfu from Greece and held it until demands for apology, and indemnity of $2,500,000 had been granted. See GREECE.

Language.—Italian is one of the Romance languages, and is the one which most closely resembles their common source, Latin. Barbarian invasions of Italy were of a less permanent character than in France or Spain, and Roman culture had a firmer grip of the population. There is hardly a leading language today with so many dialects as Italian; this is due partly to the lack of political unity of the country until lately, partly to the fact that certain districts were more open to foreign influences than others. The differences, however, are seldom of a deep nature, and are more a matter of pronunciation. Caix gives the distribution of the leading dialects as follows: (1) Venetian, the most unorthodox of all, spoken in S. Tyrol and on the Austrian Adriatic coast. It is colored with German, Romansch, and Dalmatian. (2) Gallic Italian, influenced mainly by French. It in its turn comprises several local dialects—*viz.*, Bolognese, Lombard, Piedmontese. (3) Pure Italian, spoken where Roman influence was strongest, in the old Papal States, in Tuscany, Umbria, Campania, Apulia, and Abruzzi. (4) Ibero Italian, including a group of dialects strongly influenced by Spanish or the now dead Sardinian—*e.g.*, Corsican, Ligurian, Genoese, Calabrian, and Sicilian.

The political unity of Italy and the standardization of elementary education are having their unevitable effect in levelling down these local differences, and the probability is that the next fifty years will see the disappearance of many of these dialects as languages spoken by any but the very poor, and the formation of a uniform Italian language-standard, probably holding the balance between pure and Gallic Italian.

Literature.—The chief characteristic of early Ital. literature is its contempt for the vernacular and its leaning towards Latin, and not until XIII. cent. is there a serviceable vernacular.

Poetry.—In XI. cent. Troubadours invaded Italy, and in XIII. cent. the Sicilian-Provençal school, headed by Emperor Frederick II. of Hohenstauffen, produced lyrics imitating the, by that time, decadent Provençal lyrics. The Umbrian school of St. Francis of Assisi and Jacopone da Todi wrote religious lyrics; and the Tuscan poets, Cavalcanti, Pistoia, and Dante, wrote lyrics in almost pure Italian. The poetry of the

Troubadours by its beauty and perfect versification encouraged men to make the vernacular a beautiful literary language, but the Provençal subject-matter gave to Italy a stilted, conceited, conventional style. What the vulgar literature wanted was ideas. Dante saw the possibilities of Italian, and his *De Vulgari Eloquentia* is a vindication of the vernacular; he eschewed the empty rhetoric of Provençal lyrics, and wrote lyrics full of thought and passion. With his *Divine Comedy* he reached the highest Ital. poetry of all time. Petrarch, his contemporary, brought the sonnet to excellence. Both poets had imitators, mostly of inferior type.

In the XV. cent. the cultured classes condemned the vernacular, but the Medici rulers of Florence, Cosimo, and Lorenzo de' Medici, encouraged a return to the vulgar tongue. The Romantic epic introduced by Pulci was elaborated by Boiardo and perfected by Ariosto, and Lorenzo de' Medici, Pulci, and Sannazaro wrote pastoral poetry. All are Renaissance poets, but Ariosto is the greatest of all. In the XVI. cent. Trissino adopted the class. manner in historical epic, but his imitators returned to the Romantic epic, with its pseudo-classicism. Berni headed a group of humorous satirical poets which included Grazzini. Italy, torn by invaders in XVI. cent., brought forth a decadent literature—the literature of the *Secentismo Period*. Tasso alone stands out as a great poet with his *Jerusalem Delivered*. Marini's epic *Adone*, 1623, shows the bombastic, artificial style of the period. In 1690, the 'Academy of Arcadia' strove to combat 'Marinism' by seeking simplicity. About 1760, the Ital. Romantic movement began, with Manzoni as leader; in Leopardi, greatest Ital. lyric poet since Dante found its highest expression.

The revolt against romanticism was led by Carducci, 1836-1907, and his pupil Pascoli. D'Annunzio, *b.* 1864, writes lyrics of great originality of form; he conbines classicism with romanticism and adds XX. cent. realism.

Drama.—The first sign of drama is found in the *lauda*, a religious song with dialogue used by Todi. The first secular drama is Sannazaro's pastoral poem *Arcadia*. In XVI. cent. Ariosto and Machiavelli wrote comedies in the class. manner of Plautus and Terence. Tasso, in *Aminta*, brought pastoral drama to perfection, and he was rivalled by Guarini in *Pastor Fido*. Aretino, 1492-1536, shows in his comedies the corruption of an age that produced Machiavelli, and in his tragedy *Orazia* the Renaissance sense of beauty. Trissino in his tragedy *Sofonisba*, 1515, and Giraldi imitated Señecan drama. At the end of XVI. cent. the pastoral drama developed into opera (*cf.* Rinuccini's *Dafne*), and in XVII. cent. the melodrama of Metastasio is set to music. In next cent. Fr. drama and that of Shakespeare was imitated by Martelli and Conti. Goldini, 1707-93, raised comedy above the level of the *Commedia dellarte* with its conventional clowns. The great tragedian, Alfieri, 1749-1803, wrote twenty-two tragedies, the greatest of Ital. literature. The romanticist Manzoni in tragedy followed Shakespeare, and Giambattista Niccolini also wrote romantic drama. In the XIX. cent. realism came into drama (*cf.* Rovetta and Giacosa, Testo, Martini, D'Annunzio).

Prose.—Ital. prose began about middle of XIV cent. with Guittone d'Arezzo's epistles, and at the same time short stories, sermons, and chronicles were written in the vernacular. No prose of importance appeared before Boccaccio's *Decamerone*, a collection of tales. This great work inspired men like Guardini to write prose stories. After the Renaissance there is no great prose till Machiavelli wrote *Il Principe*, and Guicciardini his famous histories. Bandello and Grazzini in their tales show the blending of classicism and vernacularism. In XVI. and XVII. cents., when 'Marinism' was obsessing poetry, prose became tainted, and writers of history like Rosa and Menzini continually criticized the evils.

Literary criticism flourished under men like Zeno and Mazzuchelli, and Manzoni wrote historical novels which influences Grossi and d'Azeglio. In XIX. cent. Verga was the first realist in prose fiction; Fogazzaro was realistic and romantic, while d'Annunzio was acknowledged as a master of the novel. The country was rich in scholars—Villari, Comparetti, Croce, Ferrero (to name but a few)—whose contributions to history, literary criticism, etc., often attain the level of literature.

ITASCA LAKE. See MISSISSIPPI.

ITCH, any irritating skin disease. The commonest form is scabies, a disease caused by the animal parasite, *sarcoptes scabei*, which burrows under the skin and causes intense irritation, leading to scratching on the part of the patient with resulting rawness, scabs, and eczematous conditions. It may occur on any part of the body, but rarely on the scalp, and often between the fingers. The treatment is application of sulphur ointment. *Barber's itch* is caused by a fungus and affects the hair follicles, particularly those of the beard. The inflammation set up leads to the formation of pustules at the root of each hair affected. *Cuban itch*, an irritating skin disease introduced by soldiers from Cuba; it is supposed

to be a mild variety of small-pox. *Collie itch*, a skin-inflammation common amongst field-workers in Assam and other tropical countries. It is caused by the larvæ of *uncinaria duodenalis*, and the eruptions are confined to the surface of the lower extremities.

ITHACA (38° 25′ N., 20° 40′ E.), small island, Ionian Isles; celebrated as the traditional home of Ulysses; area, *c.* 43 sq. miles; surface mountainous; principal town, Vathy; produces currants, sponges, olive, oil, wine. Pop. *c.* 13,000.

ITHACA, a city of New York, in Thompkins co., of which it is the county seat. It is on the Lackawanna, the Lehigh Valley, and the Central, New York Southern railroads, and on both sides of Cayuga Lake, and on the New York State Barge Canal. Excellent water power is derived from Fall Creek. In the neighborhood are a number of beautiful cascades and falls. The industries of the city include the manufacture of glass, typewriters, clocks, fire arms, salt, etc. The city is widely known as the seat of Cornell University. There are also other educational institutions. It is a favorite summer resort. It is the center of a large agricultural area which embraces several counties. Pop., 1920, 17,204.

ITHOME, the name of a fortress and mountain in Messenia, ancient Greece. The fortress played an important part in the Messenian wars waged against Sparta during the 7th and 5th centuries B.C.

ITO, PRINCE HIROBUMI (1838-1909), Jap. statesman; visited Europe to gain some personal knowledge of Western nations; studying educational and military systems, as well as constitutional forms of government; on the overthrow of the Tycoon government, a revolution followed, in which he took a prominent part; became prime minister, 1886, an office which he held four times, finally resigning, in 1901; devoted his life to the reorganization and reconstruction of Japan; responsible for the constitution of new Japan; made a prince, 1907, and nominated as first Jap. viceroy of Korea; assassinated at Harbin.

ITO, YUKO, COUNT (1843-1914), a Japanese naval officer; *b.* in Satsuma Province. After serving through the various grades, he became rear-admiral, in 1886, and admiral, in 1888. He commanded the Japanese fleet at the great sea battle of the Yellow Sea, on September 7, 1894, which resulted in the defeat of the Chinese fleet. He was appointed Chief of the General Naval Staff, and held this post during the Russo-Japanese War.

ITRI (41° 16′ N., 13° 33′ E.), town, Italy. Pop. 5,800.

ITURBIDE, AUGUSTINE DE (1783-1824), Mexican emperor for less than one year; originally adhered to Spain, later adopted national cause; emperor, 1822; forced to abdicate, 1823; outlawed; on returning, executed.

IUKA (34° 50′ N., 88° 12′ W.), town, Mississippi, U.S.A.; site of indecisive battle in Civil War, 1862.

IVAN, OR JOHN, name of several Russian rulers; *Ivan I.*, Grand-Duke of Vladimir (succ., 1328); acquired *Tver* and other dominions; took title Grand-Duke of Moscow. *Ivan III., the Great* (1440-1505), Grand-Duke of Muscovy, began to reign, 1462; abolished Tartar rule and brought provinces and principalities of Muscovy under central government; patron of art and learning. *Ivan IV.* (1530-84), *Ivan the Terrible*, was first to assume title of Tsar; he succ. in 1533, and did a great deal in developing art and commerce in the country, besides extending his dominions and introducing many reforms. He annexed Kazan and Astrakhan, and later Siberia, but failed in his attemps to acquire Livonia. In his later years the cruelty of his rule made his name a byword; at Novgorod, in 1570, he is said to have put to death about 60,000 people for alleged treason in six weeks. In 1580, he killed his *s.* Ivan, in a fit of rage, and passed the rest of his life in sorrow for the deed. *Ivan V.*, Tsar of Russia (1666-96), was of weak mind, and the conduct of affairs devolved upon his *bro.*, Peter. *Ivan VI.* (1740-64), succ. his *great-aunt*, the Empress Anne, in 1740; deposed, 1742; imprisoned twelve years, and then put to death.

IVANGOROD, fort. tn., Poland (51° 33′ N., 21° 48′ E.), at confluence of the Vistula and the Vieprz, 67 m. S.S.E. of Warsaw; formed S. apex of Polish triangle of fortresses; defended by nine forts on R. bk. and three on L. bk. of river. Field fortifications repulsed Germans at first attack, Nov., 1914; place abandoned by Russians during their great retreat, Aug. 4, 1915, but guns and munitions removed. Passed to Poland on signature of Peace Treaty, 1919.

IVANOVO-VOZNESENSK (57° 2′ N., 41° 1′ E.), town, Vladimir, Russia; great cotton manufactures. Pop. 68,540.

IVES, FREDERICK EUGENE (1856), inventor; *b.* in Connecticut; educated in public schools of Connecticut; 1874-1878 in charge of photographic laboratory of Cornell College; 1878 invented first prac-

tical process of half-tone photo-engraving, also realized first successful process of othochromatic photography; 1886 invented half-tone photo-engraving process now used. Started experimenting in 1878 in color photography on the so-called trichromatic principle which culminated in the three-color printing process in the typographic press, and in the 'Kromskop,' 'Tripak,' and 'Hicrom' processes. Invented a process for making moving pictures in natural colors. Awarded medals by many societies, including the Cresson gold medal, Franklin Institute, Philadelphia, and Progress Medal, Royal Photograph Society, for color photography work, Science Medal, Royal Photograph Society, London, and Scott Legacy Medal, Franklin Institute, for the Parallax Stereogram.

IVES, HALSEY COOLEY (1841-1911), American artist and museum director; *b.* at Mountour Fall, New York, in 1841. He studied at the South Kensington Art School, London, and under Piatowski, and was in charge of the art department of the Chicago World's Fair, in 1893, filling the same position at the St. Louis Exposition, in 1904, where he received the Grand Prize for his services in the cause of art education. He was the United States representative in art matters several times in Europe, and became the director of the Museum and School of Art in St. Louis, in 1896.

IVIZA, IVIÇA, IBIZA (39° N., 1° 25′ E.), one of Balearic Isles, Mediterranean; area, *c.* 229 sq. miles; salt, lead, fruit, cereals. Pop., 1900, *c.* 23,500. Chief town, Iviza (38° 54′ N., 1° 26′ E.),, is episcopal see; fortified. Pop. 6,500.

IVORY, material found especially in form of tusks in elephants, boars, etc.; developed from vascular pulp in concentric layers forming a compact mass, the pores of which are filled with a gelatine substance. It is a variety of dentine.

I. has been used from earliest times as an article of commerce. The chief source is from male African elephants, while boars, hippotami, and walruses (*qq.v.*) produce a smaller quantity.

Elephant I. is easily workable and takes a high polish; it is therefore in demand both for useful and ornamental articles, such as knife handles, piano keys, billiard balls, and carved work. London, Antwerp, and Hamburg, are the chief markets.

Mammoth ivory has been found in Siberia and N. Europe, but only about half is sufficiently well preserved to be used.

Substitutes for I. include celluloid and corozo nuts ('vegetable ivory').

IVORY COAST, CÔTE D'IVOIRE (5° N., 5° E.), Fr. colony, N. coast of Gulf of Guinea, between Liberia and Gold Coast; part of Fr. West Africa. Area is *c.* 130,000 sq. miles. Surface rises from low coastal region to mountainous Kong territory in N.E.; much of interior densely forested. Among largest towns are Grand Bassam, Bingerville (capital), Abijean, Assinie. Maize, coffee, rubber, fruit, gold, mahogany, are among products. Fr. trading ports were founded here in XVIII. and XIX. cent's; French acquired concessions on coast in 1843, and have actively occupied district since 1883. Pop. 1,132,812.

IVORY PALM, a low growing plant of the palm family, which is a native of the warmer parts of South America. It bears fruit in the form of a cluster of drupes weighing, when ripe, about 25 pounds. Each drupe contains 69 seeds, about the size of a hen's egg. This is very hard in texture and resembles ivory. It is manufactured into buttons, door knobs, umbrella handles, and other articles, under the name of vegetable ivory. The seeds, known as corozo nuts, are imported in large quantities.

IVRY-SUR-SEINE (48° 49′ N., 2° 20′ E.), town, Seine, France; glass, steel, chemicals. Pop. 40,000.

IVREA (45° 28′ N., 7° 52′ E.), town, Italy; seat of bishopric; X.-cent. cathedral. Pop. 12,000.

IVY (*Hedera helix*), and evergreen, climbing, by means of an extensively developed system of adventitious rootlets, upon trees, walls, and similar places. The leaves are dimorphic, being five lobed on the climbing shoots and lanceolate on the free, flowering shoots. The flowers are inconspicuous, but appear in the autumn, and hense are eagerly visited by insects. The fruit is a berry. When regularly pruned, I. forms an excellent protection of walls against rain, and is commonly grown for this reason as well as for its ornamental qualities. I. was held sacred to Osiris by the Egyptians, and to Bacchus by the Greeks.

IXION (classical myth.), king of the Lapithæ, Thessaly; chained by Zeus to burning wheel for attempting to violate Hera.

IXTACCIHUATL, IZTACCIHUATL (*c.* 19° N., 98° 32′ W.), extinct volcano, Mexico.

IYENAGA, TOYOKICHI (1862), publicist; *b.* in Japan; Bachelor of Philosophy, Oberlin College, 1890; Doctor of Philosophy, Johns Hopkins; 1890-1895 at Waseda University and Higher

Commercial College, Tokyo professor of political science; 1895-1897, secretary for Department of Foreign Affairs; 1898-1899, Commissioner of Formosan Government to Turkey, China, Persia, and India; 1901-1920, at University of Chicago, professorial lecturer on political science; 1913, lecturer at Columbia University. Author of: (with Kenoske Sato) *Japan and the California Problem.*

IZBARTA, SPARTA (37° 44′ N., 30° 22′ E.), town, Asia Minor. Pop. *c.* 20,000.

IZHEVSK (56° 52′ N., 53° E.), town, Vyatka, Russia. Pop. 23,000.

IZMAIL, OR ISMAIL, tn., Bessarabia, Rumania (45° 22′ N., 28° 47′ E.), was captured by Russians from Turks, in 1790, afterwards becoming central station of Russian Danube fleet; trade in cereals, wool, tallow, hide; flour milling. During World War, Germano-Bulgar forces reached Tulcea, opposite Izmail, but failed to cross. Pop. 32,400.

IZU-NO-SHICHI-TO (*c.* 34° N., 139° 30′ E.), seven islands of Izu, Japan, extending S. from Tokyo Bay.

J

J, a modified *I*; dates from XIV. cent.; consonantal sound when initial letter of word, often vocalic sound in middle or end.

JABALPUR. See JUBBULPORE.

JABIRU, or **MYCTERIA,** a genus of birds belonging to the stork family (Ciconiidæ). The American Jabiru, which is found from the Argentine northward to Mexico, stands sometimes as much as five feet high; has pure white plumage, except for the black neck and head, and massive, slightly-upturned bill. Other species occur in India, Australia, and Africa.

JABLONICA (OR DELATYN) PASS, one of principal passes of the Transylvanian Carpathians, Rumania (48° 20′ N., 24° 24′ E.), through which the railway runs from Delatyn to Maramaros Sziget; scene of fighting in March and April, 1915, during Russian invasion of Galicia; again in Aug., 1916, when Lechitsky captured the heights commanding it; in Dec., 1916, during Falkenhayn's drive towards Bukharest; and in March, 1917, in the last stages of Rumania's resistance.

JABORANDI, the native Brazilian name for a number of drugs prepared from several rutaceous plants, but particularly from the leaflets of *Pilocarpus pennatifolius.*

JACAMARS, a little-known species found in the dense tropical forests of S. America, E. of the Andes, and classed in the family of the Galbulidæ. The golden, bronze, and steely lustre of their brilliant plumage, and the length and sharpness of their straight bills, are their chief characteristics. They are usually seen sitting motionless on trees and are therefore counted dull and stupid. The largest species is the *Jacamerops grandis.*

JACANA, or **PARIDŒ,** a family of birds, whose most striking feature is the length of their toes and claws, which enables them to travel on the flat leaves of water-lilies and other river plants. Their eggs are a rich olive-brown, usually streaked with dark lines. The common J. (*Parra jacana*) of Brazil is black with green plumage on the wings and a warm-brown neck. In habit it resembles a water hen. The *Hydrophasianus,* or pheasant-tailed J., frequents the marshes and lagoons of India and China, and is the largest of all the genera.

JACARANDA, a genus of Bignoniaceæ, found in tropical America, consists of about thirty species which are noted for their heavy, fragrant wood; these are also frequently known by the name of rosewood. J. *ovalifolia,* the green ebony, and J. *mimosifolia,* a native of Brazil, are common species.

JACK, corrupt form of John, the commonest name in European countries, and hence used as a general name with a contemptuous signification, *e.g.* J.-of-all-trades, J.-ass, J.-an-apes; and of common implements, etc.—boot-J., J. (knave in cards), and J.-a-lantern.

JACKAL, member of Dog Family. Common J. (*Canis aureus*) of S. Asia and N. Africa, *c.* 3 ft. long, has bushy tail and is brownish; nocturnal, it hunts in packs; feeds on offal, and is general scavenger; howls hideously. S. African varieties are black-backed J. (*C. mesomelas*) and striped J. (*C. adustus*).

JACK DAW. See CROW FAMILY.

JACK-IN-THE-PULPIT, the popular name of a species of arum, common in the United States. The name comes from its resemblance to a figure standing in the pulpit.

JACKSON, a city of Michigan, in Jackson co., of which it is the county seat. It is on several lines of railroad, and on the Grand River, 76 miles W. of Detroit. It is the chief trade center and distributing point for a large coal mining, oil producing and agricultural region. Its industries include the manufacture of machinery, corsets, chemicals, oil stoves, glass, and refrigerators. The city is the seat of the State Prison. Power is derived from the river. Pop., 1920, 48,374.

JACKSON, a city of Mississippi, the capital of the state, and the county seat of Hinds co. It is on several important

railroads and on the Pearl River, 40 miles E. of Vicksburg. It is the trade center for a large farming and cotton raising area. It has important industries, which are chiefly connected with cotton. There are also iron foundries, railroad repair shops, fertilizing factories, and plants for the making of agricultural implements. The city has a large trade, especially in cotton, through the port of New Orleans. Its public buildings include the State Capitol, State Lunatic Asylum, State Institution for the Deaf and Dumb, State Law Library, State Prison, and Millsaps College. Pop., 1920, 22,817.

JACKSON, a city of Ohio, in Jackson co., of which it is the county seat. It is on the Baltimore and Ohio, the Southwestern, and the Detroit, Toledo and Ironton railroads. Its chief industries are connected with coal and iron mining. It has also foundries, a shoe factory, and railroad shops. Pop., 1920, 5,842.

JACKSON, a city of Tennessee, in Madison co., of which it is the county seat. It is on the Illinois Central and other railroads, and on the Forked Deer River. It is the trade center for a large agricultural region and an important cotton market. Its industries include the manufacture of engines, boilers, cottonseed oil, lumber, machinery, and woollen goods. It is the seat of the Baptist University, Memphis Conference Female Institute, and Lane College. Pop., 1920, 18,860.

JACKSON, ANDREW (1767-1845), seventh President of the United States; *b.* in the Waxhaw settlement, so close to the border line between N. and S. Carolina that both states have claimed him as its citizen. He was born a few days after his *f.* died, and grew up in poverty. His education was limited, but he read what he could, and at the age of 17 entered a law office at Salisbury, N.C. He was admitted to the bar in 1787, and the following year opened a law office in Nashville, Tennessee. In 1789, he was made public prosecutor for three Tennessee counties, and performed his duties so energetically and fearlessly as to win a State reputation. He was chosen as Congressman in 1796, and the next year served as Senator for a brief time, to fill a vacancy. He resigned in 1798, to become a judge of the Tennessee Supreme Court, holding that position for six years. From 1804 to 1811, he engaged in business, but was unsuccessful. In the war of 1812 he volunteered his services, but for the greater part of the time was engaged in subduing the Creek Indians. In 1814, he was made a major general in the regular army, and drove the British from Florida. In January, of 1815, he won the great victory of New Orleans, defeating Pakenham's 12,000 veterans, though his own forces numbered only about 6,000. Only seven Americans were killed and six wounded, while the British loss in killed, wounded, and captured was over 2,000. This brilliant victory made Jackson a popular hero, and this popularity was enhanced by the victorious conclusion to which he brought the Seminole war, in 1818. He was made territorial governor of Florida, 1821; United States Senator, 1823; and in 1824, was a nominee for the Presidency. He received the most electoral votes, but as no candidate had a majority, the election was thrown into the House of Representatives, and John Quincy Adams was elected. In 1828, Jackson again ran for the Presidency and was elected, receiving 178 electoral votes to 83 for Adams. In 1832, he was re-elected.

Jackson had great qualities and great defects. He was the most illiterate man that ever held the Presidency. He had strong convictions and violent prejudices. His judgments and decisions were based rather on his intuitions than on broad knowledge and study of the problems that came before him. But he was honest, courageous and strong in his sympathies for the common people, from whom he came and whose champion he was. He checked tendencies toward monopoly and privilege and maintained the power of the central government as against the states, as in the famous S. Carolina nullification controversy. He destroyed the United States Bank with disastrous results to the nation. He was an ardent advocate of the 'spoils' system. He was impatient of Congress and the Supreme Court, except when they agreed for him. As far as our system of government permitted, he was a despot, though he honestly believed that his tyranny was for the best interests of the people.

JACKSON, CHARLES LORING (1847), chemist; *b.* in Boston, Massachusetts; 1867, at Harvard College, Bachelor of Arts; 1870, Master of Arts; 1873-1875, at Heidelberg and Berlin Universities; 1868-1871, assistant in chemistry; 1871-1881, assistant professor; 1881-1899, professor; 1899-1911, Erving professor in chemistry; since 1911, professor emeritus at Harvard College. Member, National Academy of Science, fellow, American Academy of Arts and Sciences. Author of many papers on chemical subjects.

JACKSON, CHARLES TENNEY (1874), author; *b.* in St. Louis; at University of Wisconsin, 1896-1897; joined 1st Wisconsin Volunteers, 1898; newspaper correspondent during Spanish-American war; on staff San Francisco

paper, 1907-1908; on Milwaukee paper, 1909. Author, *Loser's Luck, 1905*; *Day of Souls, 1910*; *My Brother's Keeper, 1911*; *The Midlanders, 1912*; *The Fountain of Youth, 1914*; *John-the-Fool, 1915*; *The Call to the Colors, 1918*; *Jimmy May in the Fighting Line, 1919*; *Captain Sazarac, 1922*.

JACKSON, CHARLES THOMAS (1805-1880), an American scientist; *b.* at Plymouth, Mass He graduated from Harvard in 1823, and for a time served as geologist of Maine and New Hampshire. He made many discoveries in electricity, and claimed to have been the founder of anæsthetics.

JACKSON, FREDERICK GEORGE (1860), Eng. Arctic explorer; after travelling in Australia, crossed the Siberian tundras in mid-winter; led the Jackson-Harmsworth Polar expedition to Franz Josef Land, 1894-97; served with distinction in the S. African War, and in the early part of the World War; author of *The Great Frozen Land, 1895*; and *A Thousand Days in the Arctic, 1899*.

JACKSON, HELEN MARIA FISKE HUNT (1831-1885), American author and poet; *b.* in Amherst, Massachusetts, October 18, 1831; *d.* in San Francisco, August 12, 1885. She married, at 21, Captain Edward Hunt, and after his death, in 1867, began a literary career which for variety of productions and general high quality, has rarely been equalled in this country. Novels, essays, poems, works of travel, and juveniles, followed each other in rapid succession. Most of her work was signed 'H.H.' After marrying W. S. Jackson, of Colorado Springs, she became interested in the wrongs of the Indians, and wrote the powerful novel-tract *A Century of Dishonor, 1881*. It was followed by *Ramona*, in which the leading actors are of Indian blood. This was her most popular work. *Mercy Philbrick's Choice* and *Hetty's Strange History* appeared in the *No Name* series. Other books: *Bits of Travel, 1878*; *Sonnets and Lyrics, 1886*; She is credited with having written the *Saxe Holme* novels. See Col. Higginson *Contemporaries*.

JACKSON, THOMAS JONATHAN (1824-63), American Confederate commander; *b.* Clarksburg, W.Va. His early youth was a severe struggle with poverty. He graduated at the U.S. Military Academy, in 1846; served in the Mexican War, 1846-47, and won the brevet of major at Chapultepec. He resigned from the army, in 1852, and until the outbreak of the Civil War taught natural and experimental philosophy and artillery tactics at the Lexington, Va., Military Institute. He went with Virginia when it seceded, entering the service as a colonel and being commissioned as a brigadier general in July, 1861. The stubborn defence put up by the troops under his leadership in the first battle of Bull Run gave him the name of 'Stonewall,' by which he he was afterward commonly known. His services earned him a major generalship in September of 1861, and in the following year he did brilliant work in defeating Banks in the Shenandoah Valley, and thwarting the plans of McClellan in the Peninsula campaign. As a corps commander he played a prominent part in the battle of Gaines' Mill, Malvern Hill, Cedar Mountain, the second battle of Bull Run, and at Antietam. By this time his military prowess had demonstrated to the Confederates and Unionists alike that he was the ablest leader in the Confederate army, with the possible single exception of Lee himself. He He moved with bewildering rapidity, struck like a thunderbolt, and, like Napoleon, was always at the point where the enemy least expected him to be. He combined the tenacity of Grant with the dash of Sheridan, and was the idol of the Confederate army. He commanded the Confederate right at Fredericksburg, Dec. 13, 1862; was raised to the rank of lieutenant general, and made a famous flanking march against Hooker's right that practically decided the battle of Chancellorsville in favor of the Confederates. It was a costly victory, however, for Jackson was shot accidentally by his own men, May 2, 1862, while making a reconnaissance. His death was the deadliest military blow dealt to the South. Jackson was a man of deeply religious nature. His usual announcement of a triumph was: 'God this day blessed our arms with victory.' In his personal traits and military characteristics he has often, and justly, been compared to Oliver Cromwell.

JACKSONVILLE, a city of Florida, in Duval co. It is on the Florida East Coast and other railroads, and on St. Johns River. It is about 30 miles from the coast and is connected by steamship with all points on the St. Johns River, and with Charleston, New York, Boston, and other cities. It is the center of an extensive farming, fruit growing, and lumbering region; it has a large wholesale trade; it has also valuable phosphate interests. The city is widely known as a winter resort. It is the seat of St. Luke's Hospital, the largest in the state, and contains the general offices of several railroads. The city if provided with an excellent system of docks. During the Spanish-American War, Jacksonville was used as a port of embarkation for troops

and supplies for Cuba, and as a coaling station. Pop., 1920, 91,543.

JACKSONVILLE, a city of Illinois, in Morgan co., of which it is the county seat. It is on the Wabash, Chicago and Alton, Chicago, Peoria and St. Louis, and the Chicago, Burlington and Quincy railroads. The city is popularly known as the Athens of the West, as it contains several prominent educational institutions, including Illinois College, Illinois Women's College, Illinois College of Music, and State institutions for education of deaf mutes and the blind. It is also the seat of the State Central Insane Hospital, and has several other hospitals. Jacksonville is the center of trade for several surrounding counties. Its industries include the manufacture of woolen goods, candy, machinery, wire, pumps, boilers, paper, and flour. Pop., 1920, 15,713.

JACOB, OR ISRAEL, the patriarch of the Israelites; *s.* of Isaac; there are accounts of J. in *Genesis.*

JACOB OF EDESSA (*b. c.* 645 A.D.), Syriac bp.; was bp. of Edessa; at the monastery of Teleda he revised the Peshitta version of the Old Testament by comparing it with Gk. texts—his great work.

JACOBA, JACQUELINE (1401-36), Countess of Holland; Bavarian claims disputed by *uncle,* John of Bavaria; defeated by Philip of Burgundy.

JACOBI, ABRAHAM (1830-1919), a German-American physician; *b.* in Westphalia, Germany. As a medical student at Bonn he became involved in the revolutionary movement in Prussia and served two years in prison, in Berlin. On his release, in 1853, he came to this country and began to practice in New York City. In 1860, he became professor of the diseases of children at the New York Medical College; and in 1865 became a member of the faculty of the University of the City of New York, in the same capacity; he was also a teacher at the College of Physicians and Surgeons later. In his particular field he became one of the leading authorities in this country. Among his works are: *Dentition and its Derangements, 1862*; *Infant Hygiene, 1873*; *Diphtheria, 1880*; and *Therapeutics of Infancy and Childhood, 1895.*

JACOBI, MARY PUTNAM (1842-1906), an American physician; *b.* in London, England. Coming to this country at a very early age; she graduated from the New York College of Pharmacy, and continued her studies abroad. In 1881, she began to practice in New York City, later becoming clinical professor of the diseases of children at the New York Post-Graduate Medical School. She was the wife of Abraham Jacobi. Among her works are: *The Question of Rest for Women During Menstruation, 1877*; *The Value of Life, 1879*; and *Common Sense Applied to Women's Suffrage,* 1894.

JACOBINS, members of a Fr. political club formed at the outbreak of the Fr. Revolution, 1789; so called from Jacobin Convent, in Paris, where they held meetings; club had branches all over France, and became the principal power in the country, being supreme during the 'Reign of Terror.' Its members included Mirabeau, Marat, and other Revolutionary leaders; later on, Robespierre became pres., and under his influence the policy of the club became more extreme; his fall, in 1794, led to its dissolution the same year, and the meeting-place was closed.

JACOBITE CHURCH, name given to Syrian Monophysites who refused to accept the Chalcedonian definitions; many have seceded to Rome and are called Syrian Uniats.

JACOBITES, Brit. supporters of fallen royal house of Stewart; with the death of Cardinal York, in 1807, the male line ended. The present representative is Marie, wife of Prince Louis of Bavaria; she is now considered lawful queen (Mary III. and IV.) by Brit. 'legitimists.'

JACOB'S LADDER, or **POLEMONIUM CŒRULEUM,** a species of Polemoniaceæ found in temperate climates, and of rare occurrence in Britain. It is a perennial herb which attains a height of one to two feet, and bears blue or white flowers. The popular name is given to the plant because of the ladder-like arrangement of the leaves.

JACOBS, WILLIAM WYMARK (1863), English humorous writer; his *Many Cargoes, 1896*; brought him immediate fame; since then has pub. *The Skipper's Wooing, Sea-Urchins, The Lady of the Barge, Odd Craft, Night Watches, 1914*; etc.; joint-author of play *Beauty and the Barge, 1906.*

JACOBY, HAROLD (1865), Astronomer; *b.* in New York; assistant and instructor of geodesy and practical astronomy, 1888-1892; instructor of astronomy, 1892-1894; professor since 1904, acting director of Observatory, 1903-1906; director since 1906, Columbia; 1889-1890, on U.S.S. Pensacola as assistant astronomer of United States eclipse expedition to West Africa; Fellow Royal Astronomy Society, London. Author: *Practical Talks by an Astronomer, 1891*; *Astrono-*

my, a Practical Handbook, 1913; Navigation, 1917. Published by leading European and American societies are technical papers on astronomical photography, stellar parallax and star clusters. Wrote on astronomy for daily newspapers in leading cities; 1918, civilian instructor of navigation at Pelham Bay Naval Training Station.

JACQUARD, JOSEPH MARIE (1752-1834), a French mechanician; *b.* at Lyons. He invented the silk-weaving loom called after him, 1801-08, a mechanical contrivance capable of being adjusted to any kind of loom, and doing away with the guidance by hand. The silk-weavers offered violent opposition to his machine, and he narrowly escaped with his life on one occasion. His invention, however, revolutionized the art of weaving, and at his death his machine was in almost universal use. Napoleon rewarded him with a small pension.

JACQUERIE. See FRANCE (HISTORY).

JADE, greenish, hard stone, a native silicate of calcium and magnesium; generally found in veins in schists and gneisses. Owing to the veins having multitudinous fissures, large pieces are rare. Varieties are jadite and nephrite. J. is found in Persia, Turkey, Corsica, China, Siberia, and South Sea Islands, while in New Zealand, it is known as 'greenstone,' in China as 'yu-stone,' where it is elaborately carved for ornamental purposes. J. ornaments have been found in lake dwellings in Switzerland.

JADE, JAHDE (*c.* 53° 27′ N., 8° 12′ E.), bay, Oldenburg, Germany.

JAEN (1) (37° 51′ N., 3° 30′ W.); S. Province, Spain; area, 5,203 sq. miles; drained by Guadalquivir; cereals, wine, oil, lead. Pop. 535,000. (2) (37° 47′ N., 3° 50′ W.), cathedral town, capital of above; seat of bishopric. Pop. 30,000.

JAFFA OR JOPPA, seaport, Syria (32° 3′ N., 34° 45′ E.); was anciently place of export for Lebanon cedar-wood; figured prominently in Crusades, being captured by Richard Cœur-de-Lion, 1191; was taken by Arabs, 1722; and by Napoleon, 1799; is the port of Jerusalem. During World War was evacuated by Turks, and occupied by General Allenby's forces on march to Jerusalem, Nov., 1917. Chief exports are fruit (especially oranges), olive oil, barley, sesame, and wine. Pop. *c.* 55,000.

JAFFNA (9° 42′ N., 80° E.), town, on island J., Ceylon; tobacco, Palmyras. Pop. *c.* 35,000.

JAGERNDORF, or **KRNOV,** a town of Austrian Silesia, near the frontier, 14 miles N.W. of Troppau, on the R. Oppa. It has a Minorite monastery, a church (Burgberg), and a castle of the Liechtenstein princes. It is noted for woolen industries, and also manufactures cloth, organs, and machinery. Pop. 16,681

JAGERSFONTEIN (29° 45′ S., 25° 27′ E.), town, Orange Free State, S. Africa; diamonds. Pop. 9,018.

JAGGAR, THOMAS AUGUSTUS, JR. (1871), Geologist; *b.* in Philadelphia. Bachelor of Arts, 1893; Harvard College, 1894; Master of Arts, 1897; Doctor of Philosophy; Student of Munich and Heidelberg; instructor geology, 1895-1903; assistant professor, 1903-1906, at Harvard; 1904-1917, professor of geology and head of department; 1904-1912, Massachusetts Institute of Technology; 1898-1904, in charge of work in Massachusetts, Arizona, and South Dakota; assistant geologist of United States Geological Survey; in charge of various volcano expiditions from 1902-1914; 1911, established volcano experiment station in Hawaii; Volcanologist in charge Hawaiian Volcano Observatory; United States Weather Bureau; Fellow American Geographic Society.

JAGUAR. See under CAT FAMILY.

JAHANABAD (28° 37′ N., 79° 44′ E.), town, Patna division, Bihar and Orissa, India. Pop. 8,000.

JAHN, FRIEDRICH LUDWIG (1778-1852), Ger. patriot; invented a system of raising the moral and physical standard of his country by means of gymnastics. He founded the first *Turnplatz* and originated the corps of Lützow.

JAHRUM (28° 3′ N., 53° 37′ E.); town, Persia; district produces dates. Pop. *c.* 15,000.

JAIL FEVER is now recognized as a severe form of typhus fever (*q.v.*). The disease raged in English prisons in the Middle ages, breaking out at the Black Assize of Oxford, in 1577. It was caught by many attending the assizes at the Old Bailey as late as 1750, but owing to the improvements in sanitation is now of rare occurrence.

JAINS, an Ind. sect, numbering over a million, an offshoot from Hinduism. They began about 500 B.C. in direct opposition to Buddhism, which dates from the same time. They believe that many earlier prophets, Jinas (whence their name), taught their system. The Jains are animists, *i.e.* they believe that everything has a soul, and the most rigid asceticism is a sign of piety. They are

divided into two schools, called *Digambaras* and *Svetambaras*. The Digambaras generally go naked. There is an extensive lit., much of it still unpub., dating from about 400 A.D., the earlier works being in Prākrit, and from 1000 A.D. in Sanskrit.

JAIPUR, JEYPORE, (1) (27° N., 76° E.), native state, Rajputana, India; area, 15,579 sq. miles; hilly in N.W. and E.; level in interior; produces salt. Pop. 2,700,000. (2) (26° 56′ N., 75° 52′ E), town, capital of above; royal palace; jewelry. Pop. 140,000.

JAISALMIR, JAISALMER, or **JESSULMIR,** one of the chief Rajput states of India, under British control. Situated in the great Indian desert, in the W. of Rajputana, it is about 16,000 sq. miles in area. The town, cap. of the feudatory state, was founded in 1156 by Râwal Jaisal, and is 136 miles from Sukkur. There is a strong fort on the hill, with many Jain temples. Trade in wool, camels, sheep and cattle is carried on. Pop. of state, 73,000; town, about, 7,000

JALALPUR, or **JULALPUR.**—(1) A tn. of the Punjab, India, Gujarat dist., 78 miles N.W. of Lahore, noted for shawls. Pop. about 11,100. (2) A ruined tn. of Jehlam (Jhelum) dist., Punjab, India, 68 miles S.S.E. of Rawal Pindi. It is identified by Cunningham with Alexander's Bucephala, built in memory of his famous horse.

JALANDHAR, JULLUNDER, or **JULLUNDUR,** a tn. and cantonment of the Punjab, British India, cap. of Jalandhar dist., 47 miles E.S.E. of Amritsar. It is mentioned in the Mahabharata, and was once capital of the Rajput kindgom of Katoch, (IV. cent. B.C.) Pop. about 68,000 (Mohammedans and Hindus).

JALAP, drug consisting of the dried tuberous roots of a plant, *Ipomœa purga*, of natural order *Convolvulaceæ*, growing in Mexico; has a slight smoky odor, and a sweetish, nauseous taste, the chief constituent being the *jalap resin*; the extract, the powder, and the tincture are the pharmaceutical preparations; used medicinally as a purgative, especially in Bright's disease and dropsy.

JALAPA, XALAPA, HALAPA (19° 30′ N., 96° 54′ W.), cathedral town, Mexico. Pop. 34,000.

JALISCO, XALISCO, GUADALAJARA (20° 30′ N., 104° W.), state, Mexico; crossed by Rio Grande de Santiago; volcanic district; cereals, rubber, cotton, gold. Pop. 1,500,000.

JALNA, JAULNA (19° 48′ N., 75° 54′ E.), town, India. Pop. 22,000.

JALPAIGURI, JULPIGOREE, (1) (*c.* 26° 42′ N., 89° E.), district, Bengal, Brit. India. Pop. *c.* 793,000. (2) (26° 33′ N., 88° 46′ E.), town, capital of above. Pop. 10,000.

JAMAICA, largest and most important of Brit. W. Ind. islands (18° 20′ N., 77° 30′ W.); discovered by Columbus, 1494; annexed by Spain, 1509; in 1665, Eng. force commanded by Venables and Penn banished Spaniards and took possession of isl., which subsequently became great center of slave trade. In 1831-32, negro rising occurred, and in 1834, slavery was abolished; consequent lack of labor caused ruin of many sugar plantations. Negro insurrections later were sternly suppressed by Governor Eyre. In 1907, the isl. suffered from severe earthquake. Surface is mountainous, being crossed by Blue Mts., rising to 7,423 ft., from E. to W. Jamaica is drained by Black R. and other streams. Best harbor is Port Royal; largest towns, Kingston (cap.), Spanish Town. Climate generally is pleasant and healthy. Jamaica produces valuable timber, fruits, vegetables, sugar, coffee, ginger, pimento, cocoa, cinchona; cattle and horses raised. The isl. is administered by governor, aided by privy and legislative councils. No established Church since 1870. Education is free, but not obligatory. Inhabitants include whites, negroes, Indians, Chinese, half-breeds. Area, 4,207 sq. miles. Pop. 831,400. See Map of W. Indies.

JAMAICA, a former town of Queens co., New York; now a part of Greater New York. It is on the Long Island railroad, 10 miles E. of the former city of Brooklyn. The town has great historical interest and was settled in 1656. It contains many houses dating from before the Revolutionary War. Pop. about 25,000.

JAMES, name in New Testament of (1) J., *s.* of Zebedee, *bro.* of Apostle St. John, and called with him. According to Acts 12:2, Herod Agrippa slew him with the sword. (2) J. 'the less,' *s.* of Alphæus, and one of the Apostles. (3) J., 'brother of the Lord,' traditionally author of Epistle of J., and first bp. of Jerusalem; one of 'pillars' of Church.

JAMES, THE OLD PRETENDER (1688-1766), Prince of Wales, *s.* of James II.; led uncussessful expedition from France to Scotland, 1708; in rising of 1715, he landed at Peterhead, after the surrender of his supporters at Preston; seeing his cause was hopeless, he returned to France; *m.* Clementina Sobieski; lived at Rome.

JAMES I., THE CONQUEROR (1207-76), King of Aragon; succ., 1213; conquered Balearic Isles, 1232; took Valencia, 1238, and subdued surrounding district; established suzerainty over Catalonia, 1258; warred against Moors.

JAMES I. (1394-1437), King of Scotland; *s.* of Robert III.; captured by English when on his way to France, 1406; succ. while captive in England, 1406; released, 1423; crowned, 1424; made Parliament efficient representative body; curbed power of nobles; warred against England, 1436; murdered at Perth,1437; reputed author of *King's Quair* and *Good Counsel*.

JAMES II. (1430-60), King of Scotland; *s.* of James I.; succ., 1437; killed Douglas, 1452; killed at siege of Roxburgh Castle, 1460.

JAMES III. (1451-88), King of Scotland; *s.* of James II.; succ., 1460; defeated by rebels at Sauchieburn; treacherously murderd during flight.

JAMES IV. (1473-1513), King of Scotland; *s.* of James III.; succ., 1488; *m.* Margaret, *d.* of Henry VII. of England; as ally of France he led an army against England, and was defeated and slain at Flodden.

JAMES V. (1512-42), King of Scotland; *s.* of James IV.; succ., 1513; reduced the Borders to order; *m.* Mary of Guise; was defeated by English at Solway Moss, 1542; *d.* at Falkland.

JAMES I. (1566-1625), King of Great Britain and Ireland; *s.* of Mary, Queen of Scots, and Darnley; proclaimed *James VI.* of Scotland, 1567; under regents till 1581; captured in raid of Ruthven, 1582; *m.* Anne of Denmark; curbed power of nobles in Scotland. James succeeded Elizabeth on Eng. throne, 1603; two years later occurred Gunpowder Plot (*q.v.*). J. has an obstinate belief in divine right of kings, and in duty of passive obedience on part of subjects; his reign was marked by constant struggle with Parliament, which in the following reign led to Great Rebellion. He had great learning, and was much influenced by favorites.

JAMES II. (1633-1701), King of Great Britain and Ireland; second *s.* of Charles I.; distinguished himself in Fr. and Span. service, and in Dutch Wars; professed Rom. Catholicism, 1672; succeeded *bro.*, Charles II., 1685; put down insurrections of Monmouth and Argyll, 1685; persecuted Covenanters in Scotland; issued Declaration of Indulgence, 1687; escaped to France on landing of William of Orange; defeated at the Boyne, 1690; subsequently lived in France.

JAMES BAY, an inlet in the S. part of Hudson Bay. It received its name from its explorer, Captain Thomas James. It is about 300 miles long and 150 miles wide, and contains a number of islands. Moose Factory, at the mouth of the Moose R., is an important trading station of the Hudson's Bay Company.

JAMES OF HEREFORD, HENRY JAMES, FIRST BARON (1828-1911), Eng. lawyer; solicitor-gen., 1873; attorney-gen., 1873, and again, 1880-85; carried Corrupt Practices Bill, 1883; disagreed with Gladstone's Home Rule policy, and in 1886, became Liberal Unionist M.P. for Bury; Chancellor of Duchy of Lancaster in Unionist government, 1895-1902.

JAMES, EPISTLE OF, a short book of New Testament traditionally assigned to James, first bp. of Jerusalem, and *bro.* of the Lord. Though the argument is not very connected, there is distinct style and language throughout, which seem to indicate one author, though some think there has been a redactor. If work of J., it was probably written about 50 A.D. Despite its Jewish coloring, it has little of what would be expected of a Christian writing of so early a date, and is more akin to the writings of the early II. cent., at which period many critics put it. It is probably based on teaching of Jesus, Jewish wisdom, and Gk. philosophy; not mentioned by name before Origen.

JAMES, EDMUND JANES (1855), University President; *b.* in Illinois; educated at Harvard and Northwestern Universities. Doctor of Philosophy, Halle, 1877; principal, 1878-1879, at High School, Evanston, Illinois; 1879-1882, principal of High School, Normal, Illinois; 1883-1895, professor public finance and administration; professor in various colleges; president of University of Illinois, 1904-1920. Author: *Relation of the Modern Municipality to the Gas Supply, 1886*; *The Legal Tender Decisions, 1887*; *The Canal and the Railway, 1890*; *Federal Constitution of Germany, 1890*; *Federal Constitution of Switzerland, 1890*; *Military Training in our Land, 1916*.

JAMES, GEORGE FRANCIS (1867), University Dean; *b.* in Illinois; 1882-1885, Northwestern University; 1887, Master of Arts, University of Michigan; studied school systems and history of education in Europe for three years; 1894, Doctor of Philosophy, Halle University; 1899-1902, professor pedagogy of Los Angeles High School; 1902-1905, professor of education; 1905-1915, dean College of Education, University of Michigan; 1915-1918, dean in education, University of Nevada, and director of

State Normal School, Reno. Author: *Hand Book of University Extension, 1892 Editor of Proceedings of First National Conference on University Extension, 1892; Report of Chicago Educational Commission, 1899; Unveiling of Logan Monument, 1899; The Schools of a Democracy, 1918.*

JAMES, GEORGE PAYNE RAINSFORD (1799-1860), Brit. novelist; known chiefly by his hist. romances. Thackeray made a notable parody of his two horsemen in his *Barbazure.*

JAMES, GEORGE WHARTON (1858), Explorer, Ethnologist; *b.* in England. Devoted years to study of geology, ethnology, archaeological research in Utah, New Mexico, California, and Arizona. Lectured on these subjects with stereoptican views. Author of: *The Lick Observatory, 1888; In and Around the Grand Canyon; Picturesque Southern California; Scenic Mount Lowe; Tourists' Guide to Southern California; The Missions and Mission Indians of California, 1900; How to Make Indian and Other Baskets, 1903; The Indians of the Painted Desert Region, 1903; In and Out of the Old Missions, 1905; Singing Through Life with God, 1919; Utah, the Land of Blossoming Valleys, 1921;* and many other books.

JAMES, HENRY (1843-1916), Amer. novelist; *bro.* of William James, the psychologist; lived in England for greater part of his life; wrote many novels, short stories, and some critical works which became exceedingly popular. A consummate artist, the types of which he wrote—leisured, complex, given to self-analysis, and above all, modern—have nowhere else found a delineator so skilful. His earlier stories are American, but his later work is predominantly cosmopolitan. Among his publications are *Roderick Hudson, A Passionate Pilgrim, Daisy Miller, Life of Hawthorne, The Sacred Fount, The Wings of a Dove, Partial Portraits, Notes on Novelists, A Small Boy, The Ivory Tower, The Sense of the Past,* and *The Middle Years*—the last three being unfinished and pub. posthumously.

JAMES, JOHN ANGELL (1785-1859), Eng. Congregationalist theologian and popular preacher.

JAMES, OLLIE M. (1871-1919), an American politician; *b.* in Crittenden co., Ky. He began his career as page in the Kentucky legislature, meanwhile studying law, which he began to practice in 1891. In 1902, he was elected to Congress, where he remained until 1913, when he entered the U.S. Senate. He was chairman of the National Democratic Convention, in 1912, when Woodrow Wilson was nominated candidate for the Presidency.

JAMES MILLIKIN UNIVERSITY, an educational institution, consisting of: (1) Lincoln College, located in Lincoln, Ill., (2) The Industrial School, and (3) Decatur College, located in Decatur, Ill. Lincoln College was founded in 1865, by the synods of the Cumberland Presbyterian Church of Iowa, Indiana, and Illinois, and has departments of art, music, elocution, business, classical, and a preparatory department. Decatur College and the Industrial School were opened in 1903. All three received support from a fund left, in 1900, by James Milliken, for whom the group was named. In 1922 the total teaching staff of the Institution was 65, and the student body, 1,400.

JAMES RIVER, the largest stream of water in Virginia, rises in the Alleghenies, in the W. part of the state, its headwaters being the Jackson and Cowpasture rivers, uniting at Iron Gate. Thence the river flows S.E. to Buchanan, in Botetourt co., then N.E. to Balcony Falls, through the Blue Ridge Mountains, S.E. to Lynchburg, N.E. to Scottsville, and finally S.E. into Chesapeake Bay. Its total length is about 450 miles, being navigable for 150 miles from its mouth, up to a point a little below Richmond.

JAMES, WILLIAM (1842-1910); American psychologist and philosopher; *b.* in New York, January 11, 1842; *d.* at Chocorua, New Hampshire, August 26, 1910; *s.* of Henry James, theologian, and *bro.* to Henry James, the novelist. Educated in America and Europe; a graduate of the Lawrence Scientific School; he accompanied the Thayer expedition with Agassiz to Brazil, 1864-1865; graduate of Harvard Medical School, 1870; instructor in anatomy and physiology, Harvard, 1872-1876; assistant professor of physiology, 1885; assistant professor of philosophy, 1894, and professor of psychology, and then of philosophy. He delivered the Gifford Lectures at the University of Edinburgh, 1899-1901; Lowell Institute Lectures, 1906; Hibbert Lectures on Philosophy, Manchester College, Oxford, 1909. Professor James was especially noted in analytical psychology. His style is so clear and interesting that he is much read by the general public. In 1884, he founded the American Society of Psychological Research. Publications: *Principles of Psychology, 1890; The Will to Believe, 1897; Human Immortality, 1898; Talks to Teachers on Psychology, 1899; Varieties of Religious Experience, 1902; Pragmatism, 1907; The Meaning of Truth, 1909; Some Prob-*

lems of Philosophy, 1911; *Essays in Medical Empiricism, 1912.*

JAMESON, ANNA BROWNELL (1794-1860), Brit. authoress and art critic; *b.* Dublin; wrote *Memoirs of Female Sovereigns, 1831*; and well-known *Characteristics of Shakespeare's Women, 1832.* Five volumes represent her work as an art-critic.

JAMESON, SIR LEANDER STARR (1853-1917), S. African politician; *b.* at Edinburgh; took medical degrees in London, and went to S. Africa, where he became associated with Cecil Rhodes in Rhodesian and other enterprises; was appointed administrator of Rhodesia, 1891, and after hard fighting secured submission of Matabele tribe, 1894. The famous raid into Transvaal territory, Dec., 1895, which resulted in the defeat of Krugersdorp and capture of 'Dr. Jim' and his followers led to his supersession, Jan., 1896. After a short term of imprisonment he returned to S. Africa, and served in S. African War; was returned to Cape Legislature Assembly as member for Kimberly, and, in 1901, succeeded Cecil Rhodes as leader of Progressive party; was prime minister, 1904-5, and leader of Unionist party till 1912, when he resigned, thereafter residing permanently in England.

JAMESTOWN, a city of New York, in Chautauqua co. It is on the Erie and several other railroads, and is at the outlet of Chautauqua Lake. It is the center of trade for Chautauqua co. and is the distributing point for many summer resorts on the lake. Its interests are chiefly agricultural, but it has manufactures of clothing, boots and shoes, furniture, axes, tools, pianos, brooms, etc. There is a high school and a national bank. Pop., 1920, 38,898.

JAMESTOWN, a district in James co., Virginia, in which was made the first permanent English settlement within the limits of the United States. It was founded, in 1607, on a peninsula, 32 miles from the mouth of the James River. Through the action of the current this has now become an island, and a portion of the ancient town has been carried away. The ruins of a church, a fort, and one or two houses still remain. Jamestown was of considerable importance in pre-colonial times as the capital of the colony. The first legislative assembly ever convened in America met here in 1619. The place began to decline following the removal of the government to Williamsburg. In 1676, during the Bacon rebellion, it was burned, and never rebuilt. In 1781, it was the scene of an engagement between the Americans under Anthony Wayne, and the English forces under Lord Cornwallis.

JAMESTOWN TERCENTENNIAL EXPOSITION. See Expositions.

JAMKHANDI (16° 30′ N., 75° 24′ E.), town and native state, Bombay, India. Pop. *c.* 14,000; of state, *c.* 107,000.

JAMMU, JUMMOO, (1) (32° 40′ N., 75° 20′ E.), native state, upper Chenab valley, India. Pop. *c.* 3,000,000.

JAMNIA (31° 52′ N., 34° 47′ E.), Gk. name for Gebna, Palestine; where Sanhedrin met in I. and II. cent's.

JANAUSCHEK, FANNY (1830-1904), Bohemian-Amer. tragic actress.

JANESVILLE, a city of Wisconsin, in Rock co., of which it is the county seat. It is on the Chicago, Milwaukee and St. Paul, and the Chicago and Northwestern railroads, and on the Rock River. It is the chief trade center for a farming region which embraces five counties, which has a population of over 120,000. Its industries, which are of great importance, include flour mills, woolen mills, machine shops, and carriage factories. It is the seat of St. Joseph Convent, State School for the Blind, and has two hospitals. Pop., 1920, 18,293.

JANEWAY, EDWARD GAMALIEL (1841-1911), an American physician; *b.* in New Brunswick, N.J. He graduated from Rutgers College in 1860, and later from the New York College of Physicians and Surgeons. He was a medical cadet in Newark (N.J.), Hospital during the Civil War, after which he joined the staff of Bellevue Hospital in New York City. He was professor of clinical medicine at the Bellevue Hospital Medical School after 1897, and dean from 1898 to 1905. From 1875 till 1881, he was Commissioner of Health.

JANINA, YANINA (39° 48′ N., 20° 54′ E.), town, capital of vilayet of same name, Albania, on Lake J.; seat of Gk. abp.; manufactures gold and silver embroidered goods; under Turkish rule since 1431; fl. in the time of Ali Pasha, 1788-1822; besieged by Greeks, 1912-13; captured March, 1913. Pop. 25,000.

JANISSARIES, body of Turk. infantry, formed about 1330, as the sultan's bodyguard, originally composed chiefly of Christian captives, who were compelled to profess Mohammadanism. The number were kept up by recruiting from Christian families in Turkey. Their rules included obedience, religious conformity, and abstinence; but they soon became lawless and violent, rebelled and plotted

against the sultans, and in 1807, even deposed Selim III. The corps was dissolved in 1826, after a revolt said to have been purposely provoked by Mahmoud II.

JANIUAY (11° N., 122° 20′ E.), town, Panay, Philippines. Pop. 21,000.

JANJIRA, (1) (18° 8′ N., 73° 6′ E.), native state, Bombay, India. Pop. *c.* 89,000. (2) (18° 16′ N., 73° 4′ E), town, capital of above.

JANSEN, CORNELIUS (1585-1638), Dutch Catholic theologian; opponent of Jesuits and founder of *Jansenism*; bp. of Ypres, 1636; also student of St. Augustine and opponent of Protestantism.

JANSENISM was a religious movement in opposition to the logic of Scholasticism, the ethical rationalism of moralists, and to popular forms of devotion. Jansen wrote a work entitled *Augustinus*, and was particularly antagonistic to the Jesuits. His follower, Arnauld, published *Frequent Communions*, which roused violent opposition, and several of his propositions were condemned by the Pope, 1653. Jansenists had to fight for their existence in France, where they were persecuted; they found a refuge in Holland, where they joined the Old Catholics.

JANUARIUS, ST. (III. cent.), Neapolitan saint; traditionally martyred.

JANUARY, 1st month of year; named after Janus.

JANUS (Lat. *ianua*, a gate), ancient Rom. deity; had double head and looked both ways.

JANVIER, THOMAS ALLIBONE (1849-1913), an American author; *b.* in Philadelphia, Pa. After concluding his public school education, he became a journalist and was a member of the editorial staffs, at various times, of the *Philadelphia Press*, *Bulletin*, and *Times*. After 1881, he travelled extensively in the West and Spanish America, finally making his home in England. He wrote *Color Studies, 1885*; *The Mexican Guide, 1887*; *The Aztec Treasure House, 1890*; *In the Saragossa Sea, 1898*; *In Great Waters, 1901*; *Legends of the City of Mexico, 1910*; and *At the Casa Napoleon, 1914*.

JAORA (23° 40′ N., 75° 12′ E.), town and native state, Central India; opium. Pop. of town, 24,000; state *c.* 87,000.

JAPAN (Jap. *Nippon*, 'eastern land'), empire of E. Asia (22°-51° N., 120°-156° E.); consists of irregular chain of islands, including Kuriles, S. Sakhalin (Karafuto), Hokkaido (Yezo), Honshiu (Hondo), Shikoku, Kiushiu, Luchu (Riu-kiu) group, Formosa, and Pescadores; and Korea (Chosen) on mainland. By Treaty of Versailles Japan has obtained Ger. possessions N. of equator—Pelew, Caroline, Marshall, and Ladrone groups; she has returned to China the Ger. holdings in Shantung. The Jap. lease of Liaotung peninsula (including Port Arthur and Dairen) was extended, 1915, to ninety-nine years; at same time she secured exclusive mining right, with permission to make settlements in E. Mongolia.

Surface generally is very mountainous, with large number of active or dormant volcanoes, and the country is subject to frequent earthquake shocks, except along the N.; several of the peaks are between 10,000 and 12,000 ft. above sea-level, among highest being the beautifully shaped cone of Fuji-san, 12,400 ft., in Hondo, 60 m. S.W. of Tokio; Ontake, Tatyama, and Yari-ga-take in the Hida-Echu Mts. reach height of *c.* 10,000 ft.; Asamayama, in center of axial range of Honshiu, is an active volcano of 8,100 ft., and Mt. Morrison in Formosa is highest peak in empire (alt. 14,300 ft.). Hot mineral springs abound. Earthquake tremors are frequent, shocks common, and catastrophes occur at intervals of forty to fifty years.

The outline of all the islands is much broken; Hokkaido has a coast-line of over 1,400 m., Honshiu of over 4,700 m., Shikoku *c.* 1,100 m., Kiushiu over 2,100 m.; total coast-line of empire *c.* 18,000 m. Rivers are short and rapid, and in summer torrential, from the heavy rains and melting of snow; are useful for irrigation, but not for navigation; most important are Kitakamgawa, Tonegawa, Shinanogawa, and Kisogawa, in Honshiu, and the Ishikarigawa, in Hokkaido; largest lake is Biwa, in Omi prov., Honshiu. See Map of Asia.

Geology.—Jap. islands are most notable seismic line in the E. hemisphere; the mountain cores are composed of anc. rocks; Tertiary and Quaternary deposits cover about half the area, including the coastal plain, and Triassic, Jurassic, and Cretaceous formations about one-twelfth; about one-eighth is covered with older igneous rocks, of which granite is most important; more recent igneous rocks—*e.g.*, andesite, basalt, and liparite—form about one-fifth.

Climate naturally varies greatly; taking main islands, the temp. ranges from about 5° F. (winter) to 80° (summer) in the N., and from 42° to 98° in the S.; rainfall increases from 40 in. in the N. to over 80 in the S., and in some places may rise as high as 150. Hottest period is during July, Aug., and first half of Sept. Branch of N. Pacific current known as the Kuroshiwo ('black tide'),

which passes northward along whole S.E. coast, makes this much warmer than the N.W. Typhoons occur in summer, and are most destructive in autumn. Snowfall very heavy in N.W.

Fauna shows that at an early geological period the islands must have been connected with the Amer. and Asian continents; wild animals include bears, foxes, wild boars, deer, and monkeys, while there are many rats and other rodents. Principal domestic animals are dogs, horses, cattle, and pigs. Birds include crows, larks, pheasants, owls, nightingales, cranes, cormorants, and storks. There are numerous varieties of fish—salmon, bream, and carp—and many snakes are found. Insects include some beautiful moths and many kinds of beetles, while fleas and mosquitoes are common pests.

Flora is remarkably varied; trees include oak, beech, pine, elm, cedar, wax tree, chestnut, maple, and sago-palms, and bamboos abound. Cherry tree is largely cultivated, and the paper-mulberry and lacquer tree are characteristic and of great economic value. Fruits include oranges, grapes, persimmons, pumelos, loquats, and peaches, and there are many beautiful flowers, including Jap. lilies and azaleas. Cereals and tea are largely cultivated.

Industries.—The principal are those connected with agriculture, sericulture, forestry, and fisheries. Agriculture has been the most important industry since the earliest times, and *c.* 60 per cent of the inhabitants are engaged in farming. The country, has, however, a large amount of sterile ground among the hills, and the cultivation of the productive part is greatly hampered by the difficulties of communication, which render prohibitive the cost of transport for many agricultural products. Of the area (exclusive of Formosa) cultivated about 60 per cent is under rice, after which come barley, rye, and wheat. Owing to the use of spade-husbandry and the plentiful application of manure, the produce is much greater than might be expected, and the soil maintains, in consequence, a much larger population. The thoroughness of the cultivation renders it possible to raise two or three crops on the same field every year. Millet, beans, and peas, buckwheat, colza, potatoes, cotton, hemp, tobacco, indigo, and tea are all grown, as well as mulberries for silkworms, which are placed in vacant spaces between other crops. Cotton crop has greatly decreased in recent years, and the import of raw cotton from other countries has correspondingly increased. Tobacco is a government monopoly. Sericulture is of great importance, as silk is a principal item in Jap. foreign trade.

Cattle, horses, pigs, and goats are reared in considerable numbers, but sheep are few. Over 45,670,000 ac. are under forest— bamboos, bananas, sago and other palms, lacquer trees, camphor trees, vegetable wax, paper trees, mulberry, etc., being mingled with cypress, oak, pine, beech, and almost all the ordinary trees of the temperate latitudes of Europe and America.

Minerals are important, but are not yet sufficiently developed; coal production, especially from Kiushiu and Hokkaido, is increasing, and silver, copper (noted for its purity), antimony, gold, sulphur, iron, graphite, and china-clay are all worked, as well as petroleum (central Honshiu and Hokkaido), but the iron output is hampered by the difficulty of getting the ore to the coal. Labor is abundant and cheap, and manufactures prosper rapidly. Among those of importance are cotton, yarn and piece goods, silk piece goods, lacquer-ware, bronzes, mats and matting, carpets and rugs, porcelain, pottery, straw-plait, bamboo and cane work, matches, glass, flannel, umbrellas, fans, iron and steel goods. There are large shipbuilding yards at Nagasaki, and important iron and steel works at Wakamatsu. Fishing gives employment to about 5 per cent of the pop.; fish and raw and manufactured products were valued, 1923, at *c.* $100,000,000.

Shipping has greatly increased; there is a large mercantile marine with a net tonnage, 1923, of over 2,400,000 (five-sevenths being steamers). Japan had 8,000 m. of railway in 1923, and of this 5,856 m. were controlled by state, which took them over in 1906. The first railway in the country was that between Yokohama and Shimbashi, which was opened by the Mikado, in 1872; fifty years ago there were only 18 m. of railway in the country. A standard gauge of 4.85 ft. has been adopted. Japan is well provided with postal and telegraphic communications. Part of the trade is carried on by foreign merchants. Of the imports the largest are raw cotton, iron, other metals, machinery, and oil cake; others of importance are rice, woolens, cottons, sugar, dyes, leather, fibres, chemicals, drugs. Of the export silk and silk goods, cotton goods, and coal are of most value; and others of importance are copper, tea, matches, rice, camphor, straw-plait, earthenware, cuttle-fish, fish oil, etc. The imports come most largely from the Brit. Empire, U.S., and China; exports are sent mainly to the same countries. Principal exports to Brit. Empire are silk, copper, straw-plaits, zinc; principal imports from Brit. Em-

pire are raw cotton (from India), textiles iron and steel machinery.

Inhabitants.—The Japanese are of Mongoloid stock, but they are not a pure race, and a striking difference exists between the upper and lower classes. The former are white or light yellow in color, with oval face, obliquely set eyes and small mouth; the latter are darker in complexion and stronger in build, and have coarser features and straight eyes. The early inhabitants were the ancestors of the *Ainos*, a hyperborean race of cave-dwellers who migrated from N.E. Asia to the Jap. islands in early times, and were subsequently conquered by the race from whom the upper classes are descended. The Japanese attain their full height at an earlier age than Caucasian races; the average height of the men is an inch or two above 5 ft., that of the women *c.* 4 ft. 8 in. They are of weak physique, and it is said that 40 per cent of the students die before completing their univ. course. The head is large and the lower limbs are short in comparison with the size of the body.

Native dress for men consists of a silk or cotton shirt, and a *kimono*, with a silk belt round the waist; in cold weather several kimonos may be worn at once; and over all are the *hakama*, or divided skirt, and the *hasri*, or cloak, both of which are generally removed in the house. The native women's dress consists of a short underskirt with a kimono above, and an *obi* or belt, one and one-half ft. wide, which is wound round the body above the kimono; the hair is kept in place by means of large pins and a considerable amount of oil; it is taken down only about once a week, and to prevent its becoming untidy a wooden block curved to fit the neck is used instead of a pillow.

In character the Japanese are light-hearted and philosophical; they have great powers of endurance, and are extremely economical. There is an elaborate code of politeness.

In families, five is above rather than below the average number. Jap. houses are low, never above two stories; they are bare of furniture, having neither chairs nor tables; the people sit on the floor and have their meals placed on trays beside them, the staple article of diet being rice, while green tea is the usual beverage. Like the anc. Egyptians, the Japanese are extremely punctilious in regard to personal cleanliness; there are boiling hot open-air baths where every one bathes in public. This custom may be responsible for the spread of the various skin diseases so prevalent. Other complaints are heart disease, which is common among the coolie class, and is ascribed to the introduction of jinrickshas (light two-wheeled vehicles drawn by coolies); dyspepsia, leprosy, and elephantiasis.

Sports and pastimes include wrestling, juggling, jumping, etc.; wrestling is said to be the oldest sport known in Japan (see Ju-jitsu), and traditionally dates from 25 B.C. Kite-flying is indulged in by adults as well as children. The principal indoor amusement is dancing.

Education is obligatory for children between six and fourteen; elementary schools, number *c.* 26,000; technical schools 7,600; kindergartens, 635; and middle schools, 320. Subjects taught in primary schools are morals, Jap. language, arithmetic, history, geography, gymnastics, etc.; and in secondary schools, besides the foregoing subjects, Chinese, English, French, German, mathematics, physics, and political economy are included in the curriculum. There are over 100 high schools for girls; a girl's coll. at Tokio, called the Higher Normal School for Women, provides training for women teachers, and there is another coll., called the Women's Univ., also in Tokio. Tokio, Kyoto, Tohoku, Hokkaido, and Kiushiu are seats of state-supported universities; Tokio Univ. is the largest. The education dep. of the administration was founded in 1871, and the present educational system was established in 1873.

Religion.—There is no state religion, and all creeds are tolerated; principal religions are Shintoism and Buddhism, each of which has twelve sects. Many Christian missions have been established, and the R.C. Church has had an episcopate here since 1891. Shintoism was the original religion of the country, whereas Buddhism was imported from Korea in A.D. 552. Shintoism is a form of nature-worship, and has elements of ancestor-worship as well; thus the chief goddess, Amaterasu (sun-goddess), is said to be the ancestress of the mikados. There are numerous minor deities who are associated with mountains, streams, and other physical features. Religious festivals are a characteristic of Jap. life, many of them being observed as national holidays, and most of them relating to ancestor-worship. There are numerous Shinto temples, most of which are simple buildings. Buddhist temples are more elaborate structures, and the Buddhist ritual is more resplendent than that of Shinto. Confucianism is professed by many of the upper classes.

Government is a constitutional monarchy the present constitution having been drawn up by the Marquis Ito, in 1889. The executive is in the hands of the emperor, who is assisted by a cabinet of ten ministers nominated by himself; legislative authority is also exercised by

him, subject to the consent of the Imperial Diet. Cabinet consists of the premier and ministers for foreign affairs, interior, finance, war, marine, justice, education, agriculture, and commerce, and communications; and there is a privy council. Diet comprises a House of Peers, the members of which hold their seats by hereditary right, by royal nomination, or by election, and a House of Representatives, the 464 members being elected by popular vote. What is known as the Genro, or Elder Statesmen, have no place under the constitution, but have nevertheless been the real rulers of the country, making and unmaking prime ministers and cabinets, and advising the emperor to dissolve the Diet.

Most of the country is sub-divided into prefectures for local administrative purposes; but Chosen (Korea), Hokkaido, Karafuto (Sakhalin), and Taiwan (Formosa) are differently organized, Hokkaido being under a governor and the other three under military govs-gen. The prefectures are again subdivided into counties and municipalities, and these counties into towns and villages; the prefectures are administered by governors, assemblies, and councils, while counties and towns are respectively governed by sheriffs and mayors, in each case assisted by an assembly and council. The members of all these assemblies are elected by the people.

There is a modern system of justice; law courts are of four kinds—courts of cassation, presided over by seven judges; courts of appeal, by eight; district courts, with three judges; and sub-district courts, with one. Judges are nominated by the emperor, and hold their appointments for life unless they are dismissed as a punishment. Laws are based on Western principles, and the Code Napoléon is the foundation of the criminal laws.

The finance dep. of the administration is of great importance; estimates of revenue and expenditures are given in the Budget of each year, which must be approved by the Imperial Diet, and without the consent of the Diet no new tax may be levied. Principal sources of revenue are the liquor tax, land tax, monopolies, customs duties, posts and telegraphs, and income tax; and the chief items of expenditure are those connected with the finance dep., army, navy, communications, home affairs, and justice.

Defence.—Before 1871, the army had for several centuries been a feudal organization, consisting of the retainers of the Daimios, or fuedal lords. In early XVII. cent. a number of provinces were granted by Iyegasu to military nobles, who were vassals of the Shogun, but had absolute control over their own dominions; and the people were ranked in four classes, of which the Samurai, who rendered military service for the lands bestowed upon them by the nobles or overlords, were the first. The Samurai were noted for their unstained honor, their loyalty, and courage; and they trained themselves in the stoical endurance of pain to so great a degree that they were able to commit suicide by the terrible method of *Hara-kiri* without hesitation when honor demanded such a sacrifice.

The modern army system dates from about the year 1871, when conscription was first introduced. The supreme command is held by the emperor, who nominates the war minister, chief of general staff, and director of military instruction, as well as the military council. Service is obligatory, all men between twenty and forty being liable to service in either army or navy. The Geneki, or active army, consists of 'absolutely fit' men, who are transferred after seven and one-third years to the Kobi, or second line. There is also a territorial force known as the Kokumin. The peace strength is 355,618 of all ranks. There are numerous military schools and training colleges.

The navy became a separate dep. of the administration in 1872. The coast is divided into five naval districts, of which the headquarters respectively are Yokosuka, Kurè, Sasebo, Maizura, and Chinkai. Fleet includes 10 Dreadnoughts, 13 pre-Dreadnoughts, 12 armored cruisers, 12 protected cruisers, 5 torpedo gunboats, destroyers, torpedo boats and submarines. (See CONFERENCE ON LIMITATION OF ARMAMENT).

Towns.—The largest are: Tokio, Osaka, Kyoto, Kobè, Yokohama, Nagoya, Hiroshima, Nagasaki, Kurè, and Kanazawa. The most important ports are Yokohama, Kobè, Osaka, Moji, and Nagasaki.

Area and Population.—The total area of the empire and its dependencies (including Pacific Islands allocated under peace treaty, 1919), is *c.* 262,000 sq. m., with a total pop. of *c.* 77,400,000. Chosen (Korea) has an area of 84,738 sq. m. (pop. 17,000,000); Taiwan (Formosa), 13,944 sq. m. (pop. 3,650,000); Karafuto, 13,253 sq. m. (pop. 68,200); Pacific Islands, 800 sq. m. (pop. 100,000).

History.—There are no authentic records of Jap. history until beginning of V. cent. A.D., when under the Emperor Richu an attempt was made to construct a history of the country from old traditions and legends. The islands are said to have been formed by the gods, from whom Jimmu (660 B.C.), the legendary founder of the present dynasty, is descended. One of the most important legends refers to the conquest of Korea

by the Empress Jingo *c.* A.D. 201, to which date the beginnings of Korean civilization in Japan are ascribed.

The introduction of Buddhism took place in 552; soon afterwards the Emperor Susun was murdered, and under his successor, the Empress Suiko, the Buddhist religion was firmly established; friendly relations with China were fostered, and Chin. civilization was soon acquired. Empress Suiko belonged to the Soga family, which thus attained supremacy, but lost power in reign of Empress Kokyoku, 642-5; she was succeeded by the Emperor Kotoku, whose accession was secured by the statesman Kamatari, founder of the powerful clan of Fujiwara. The name Fujiwara was given to Kamatari in recognition of his gallant deeds, and the family he founded obtained the chief power in the state and retained it for five centuries, although they never assumed the imperial title, contenting themselves with that of regent, an office which became hereditary in the family; under their administration the power and civilization of Japan greatly increased.

During the VIII. cent. a code of laws was drawn up; the power of the emperor was gradually reduced and that of the Fujiwara increased; a law was passed which enacted that the regent must control every official action of the emperor; and the army and the Church greatly increased in power. The country continued to enjoy great prosperity until the XII. cent., when a quarrel broke out between two clans called the Minamoto and the Taira, both of which were akin to the Fujiwara; this originated in a dispute as to succession to imperial throne at Kyoto, and resulted in civil war which lasted for five centuries. The Fujiwara had been accustomed to allow only those whom they could dominate to wear imperial crown; in 1159, there were two rival candidates for the empire, and these were supported by the Taira and the Minamotot respectively. The former were successful, and secured the accession of the Emperor Nijo; Yoshitomo, the Minamotot leader, was executed, but his *s.*, Yoritomo, was allowed to escape. In later years Yoritomo raised an army against the Taira, and with the aid of his *bro.*, Yoshitsune, succeeded in defeating them and in seizing the Shogunate and becoming virtual ruler of Japan. The Mikado remained as nominal ruler, to whom the Shogun paid homage, but all real power was in hands of the latter. Yoritomo made Kamakura his center of government, and established a system of military organization; he *d.* in 1198, after which his *father-in-law*, Hojo Tokimasa, became the real head of affairs, and made his family Shikken or directors of the Shoguns.

The Hojo became so powerful that the emperor at Kyoto sent a force against them, in 1221; this, however, was routed, and the emperor sent into exile; and the Hojo remained in power for another hundred years, still retaining their title of Shikken, and securing the succession of children to the imperial throne and the Shogunate, both of which were at this time merely nominal dignities. During their administration occurred the great Mongol invasion of Japan; the first invading force was defeated at Inazu in 1274, and compelled to return to China; Kublai Khan then dispatched embassies for tribute, and as the only notice taken of this request was the execution of the ambassadors, he prepared a mighty fleet which appeared in Jap. waters, 1281; after many desperate conflicts in which great deeds of valor were performed by the Japanese, the Chin. fleet was destroyed by a storm.

In first part of XIV. cent. Go-Daigo, who was older than most of the Hojo-controlled emperors, ventured to oppose the Shikken, and was banished; his cause, however, was supported by the great generals Nitta Yoshisada, Ashikaga, Takauji, and others, who gained great victories over the Hojo, drove them from power, and re-established Go-Daigo on the throne, in 1334. He was not long allowed to hold any real power, however, the Shogunate being revived by Ashikaga Takauji, in 1336; Go-Daigo, not consenting to this, was deposed. Another Mikado was appointed by Takauji, and for over fifty years there were two rival dynasties, one in the N. and one in the S. These were eventually reunited under the Mikado Go-Komatsu during the administration of the Shogun Yoshimitsu, a member of the Ashikaga family, which held the Shogunate till 1573. That office during the XV. cent. lost a great deal of power, and during this time also the country was torn almost to pieces by civil war among the nobles and chiefs.

This condition of anarchy was ended by three great generals, Hideyoshi, Iyeyasu, and Nabunaga, the last-named being the most distinguished figure in the Jap. history of his time; he obtained control of Echizen and five other provinces, made Ashikaga Yoshiaka Shogun, and himself conducted affairs in Mikado's name; he was assassinated in 1582, after which Hideyoshi, who was one of his generals, continued his work of restoring order in the country, and obtained supreme authority under the emperor; he fortified Kyoto and Osaka, carried out various reforms, opposed the Jesuits, who had been introduced into Japan by the Portugese, and organized an invasion of Korea. After his death, in 1598, his general and *brother-in-law*, Tokugawa

Iyeyasu, assumed the chief power; he also opposed the Jesuits, and won a great victory over the nobles who supported his nephew Hideyori, the young *s.* of Hideyoshi, at Sekigahara, in 1600; he was appointed Shogun in 1603, reduced all Japan to submission, and established a united empire; his defeat of the Jesuits at Osaka, in 1615, was last important battle on Jap. ground. Iyeyasu established a fuedal system of government, which was brought to greater perfection by his *grand-s.*, Iyemitsu; and the Tokugawa dynasty, which he founded, retained the Shogunate till 1868.

During this period the country enjoyed peace and great prosperity, and increased in wealth and civilization. Foreigners were excluded until 1853, when the country was opened to foreigners following the visit of Admiral Perry and the American fleet. After this commercial treaties with America, Britain, and Russia were made, and a number of ports were declared open to foreign trade. The power of the Shogunate, meantime, had greatly declined; and the coming of foreigners hastened the break-up of the feudal system. The last Shogun resigned in 1867, after which civil war broke out between his followers and the imperial party, the latter ultimately triumphing, in 1868. The emperor then established his seat of government at Tokio and became the real ruler of the country. Feudalism was abolished and Buddhism superseded by Shintoism; army and navy were reorganized, railway and postal services inaugurated, and many reforms introduced. In 1872, Tokio was destroyed by fire, and a modern town was constructed upon the site, stone buildings superseding the former wooden houses; in the same year the slave trade was abolished in Japan.

In 1874, the desire of one section of the nation for war with Korea led to a rising, which, however, was soon put down; and in the same year an expedition was directed against Formosa, where some Jap. sailors had been killed by savages; China, to whom Formosa belonged, protested, and eventually the matter was settled by China paying an indemnity of 700,000 dollars to Japan to defray the cost of the expedition, which had established order in the hitherto uncivilized island. In 1877, there was an insurrection in Satsuma, which was suppressed; Saigo and many of the other leaders were killed, either in action or by their own or their friend's hands.

The year 1878 was marked by great progress and by a great development of the postal service. Luchu was annexed, in spite of the threatening attitude of China, in 1879. In 1881, the emperor published a decree promising to establish a constitution in 1890, and in the following year education was made obligatory. In 1889 the constitution was established, and religious freedom was granted; and new treaties were concluded with America, Russia, and other countries. Extra-territoriality for foreigners was abolished in 1899.

War with China, originating in the interests of both powers in Korea, broke out in 1894. An agreement had been made whereby China promised not to dispatch armed troops to the peninsula without informing the emperor; but as she ignored this promise and continued to send forces to the country in question, the Jap. Government informed her that war would be declared if this policy were persisted in. The first engagement, in which the Chinese were utterly defeated, was fought at A-San; shortly afterwards an alliance between Japan and Korea was concluded. Further victories were gained by Jap. arms at Chiu-lien-Cheng, Newchang, and elsewhere, and Port Arthur was taken by Oyama. In Jan., 1895, China was compelled to surrender Weihai-wei, and peace was negotiated, in April, 1895, the terms being: Japan to retain the places she had conquered, including Formosa, the Pescadores, part of Liao-tung peninsula, and Liao; Korea to remain independent; China to pay a heavy indemnity, and several ports in China to be opened to foreign trade. France, Russia, and Germany, however, objected to the incorporation of Liaotung and Port Arthur in Jap. Empire; and Japan accordingly relinquished her claim to the peninsula. While the war was still in progress, new treaties with Britain and America had been concluded, and in 1902, Britain and Japan formed an offensive and defensive alliance.

Russo-Japanese War.—Meantime, the occupation of Manchuria by the Russians, who, disregarding a former agreement, failed to withdraw from the prov. in 1903, led to strained relations between Russia and Japan; the latter, having designs on Korea, regarded Russian proximity as a national danger. War broke out in Feb., 1904. Japan had great advantage in vicinity to disputed territory and took Russia by surprise. Russia communicated by E. Siberian Ry., not yet completed, and Lake Baikal, now frozen, had to be navigated; thus nothing could be done till after spring thaw. Russia had fleet and garrisons at Port Arthur, at Vladivostok, 900 m. from Port Arthur, and in two or three minor forts; these Japan determined to attack before European reinforcements could come.

Admiral Togo sailed for Port Arthur without raising any suspicion of object, Feb. 8; engaged Russian fleet in harbor, defeated it, and attempted blockade of

port. Land army, under Kuroki, sent to force Korean Government to promise neutrality and seize Korean ports, successfully repulsed Russian outposts and crossed Yalu. Admiral Makaroff arrived from Russia, March, but went down in the battleship *Petropávlovsk*, blown up by Jap. mine; Russian General Kuropatkin arrived, March 27, and decided to make Liaoyang his base, as routes from Korea and S. and W. Manchuria met here, and it would be probable Jap. line of attack; disadvantage of policy was that it meant abandoning minor positions. Kuropatkin superseded the viceroy, Admiral Alexeiff, as commander-in-chief in the Far East, and had to face his opposition and lack of support; Alexeieff's great idea was to save Port Arthur and keep the sea free.

Kuropatkin retained chief force at Liaoyang, sent reinforcements to Lieut.-general Stoessel at Port Arthur, and to Lieut.-general Linevich at Vladivostok, and dispatched 19,000 men, under Lieut-general Zasulich, to Korean frontier and S. coast of Manchuria, where Kuroki was established; Japanese made surprise attack, May 1, and by victory of the Yalu established Jap. preeminence in Korea. Japan, which had been training for years, now attained self-confidence, and the victory facilitated loans; Russians showed hardiness and heroism, but antiquated methods and lack of initiative. Togo drew nearer in, and Jap. armies, under Oku, cut off Port Arthur by land, while General Kawamura disembarked with small force at Takushan, to serve as link between Port Arthur and Korea.

To protect Port Arthur, Russians had run strong fortifications across Kwantung peninsula, at Nanshan, which were carried by Oku, May 26; Russia sent reinforcements and ordered relief of Port Arthur; Marshal Oyama came as Jap. commander-in-chief, in July; Nogi attacked Port Arthur by land, July; the Russian fleet attempted to escape to Vladivostok and was annihilated by Togo (Aug.); Kuroki advanced, won the many days' battle of Liaoyang, and drove Kuropatkin back behind Sha-ho (Aug.-Sept.); desperate attack on Port Arthur ended in Stoessel's capitulation, Jan. 1, 1905; combined Jap. armies won battle of Mukden, in Feb., and drove Kuropatkin from Sha-ho; Kuropatkin resigned and was succeeded by Linevich. Russian Baltic fleet, under Admiral Rozhdestvensky, was annihilated by Togo in Straits of Tsushima, May 27-28. By the Treaty of Portsmouth, 1905, Russia agreed to evacuate Manchuria, to recognize Japan's pre-eminence in Korea, and to cede Liao-tung peninsula. These terms caused great displeasure among the Japanese, who considered that too great concessions had been made by their ministers, and riots occurred in various towns. At Tokio these were so serious that about 800 rioters were arrested, and martial law was proclaimed; but before long order was restored.

In Sept., 1905, a new treaty with Britain (revised in 1911) was concluded, the terms of which were very popular; this treaty aimed at maintaining peace in the East and preserving the commercial interests of all powers in China. In 1907, *ententes* concerning China were arranged with Russia and France. The Anglo-Japanese alliance expired on July 13, 1921, and was not renewed, so it was superseded by treaties made at the Washington Conference in 1922.

Later events include severe earthquakes in Formosa, and floods in Japan, in 1906, the signing of a commercial agreement with the U.S., in 1908, and the agreement with China concerning boundary of Korea, in 1909. Korea was annexed in 1910. Yoshihito succeeded his *f.*, Mutsuhito, as emperor, July, 1912.

Japan, as ally of Britain, entered the World War on Aug. 23, 1914; captured Ger. possessiom of Kiaochow, Nov. 7; took part in naval patrol of Pacific and Ind. Oceans, seizing Ger. Pacific colonies; helped to protect transports in Ind. Ocean and Mediterranean Sea. In 1918, she sent troops, under General Oi, to Siberia, and the bulk of the people supposed that annexations would follow, much disappointment supervening when the action of the U.S. imposed disinterestedness on the Allies. Nevertheless, Japan continued to retain between 60,000 and 70,000 soldiers in Siberia, though General Oi announced, on May 11, 1920, that she entertained no territorial ambitions in that country, and was prepared to evacuate as soon as conditions were stabilized. During the war, Jap. trade increased enormously, but after the war a period of financial and industrial depression set in.

In 1916, the prime minister, Marquis Okuma, resigned, and was succeeded by Count Terauchi, who was appointed by the Genro in place of Viscount Kato recommended by the retiring prime minister. This aroused resentment, and early in 1917, the question of the responsibility of the government to Parliament was raised in the Diet. So strong was the combination against Terauchi that the Diet was dissolved. The general election left the government at the mercy of a combination of parties, and the prime minister resigned, Sept. 21, 1918, being succeeded by Kei Hara, the first commoner to hold the office. The suffrage question soon gave rise to intense agitation, with the result that, in May, 1919, the franchise was extended, another

million voters being added, and the number of representatives being increased from 381 to 464. The opposition declared for adult suffrage, and tumultuous scenes occurred. Hara called in the veto of the Genro, and the Diet was dissolved, Feb., 1920, but the subsequent general election gave him a large majority, and confirmed the militaristic element in its ascendency. Hara was assassinated Nov. 4, 1921. See CHINA PEACE CONFERENCE, SHANTUNG. The Emperor Yoshihito in 1922 withdrew in favor of his *s.*, Hiro Nito, who was appointed Regent.

Beginning on Saturday, September 1, 1923, a tremendous earthquake overtook Japan and practically wiped out certain large areas, notably the cities of Tokio and Yokohama. The earthquake continued with more or less disturbances through to September 13, 1923. The total number of casualties in all districts affected by the earthquake was probably 1,500,000 and the dead numbered more than 200,000. It is hardly possible to overestimate the financial loss which reached billions of yen.

Literature.—The language is polysyllabic and is akin in structure to the Altaic group; the written language differs widely from the spoken, and there are two forms of speech and two modes of writing Japanese: it may be written in Chin. characters, which were introduced and adapted to the Jap. language late in the III. cent., or in the simpler signs of the native alphabet, known as the Kana. The verb comes at the end of the sentence, and the preposition after the noun it governs.

Jap. literature is of considerably less interest to foreigners than Jap. art. The VIII. cent. A.D., is said by authorities to have been the golden age of poetry, while the prose literature of that period is of little importance; but Jap. poetry is of little interest even at its best, and most of it is included in two compilations dating from the IX. and X. centuries. The earliest prose works are the *Kojiki*, of Book of Anc. Traditions, and the *Nihomgi*, or Chronicle; these were both written about the same time in the VIII. cent., and profess to narrate the early history of Japan, but are of no value as authentic records.

The Heian era, VIII. to XII. cent's, is regarded as the great age of Jap. prose, during this time there was a great development of literary culture, and histories, essays, romances, and other compositions were written in large numbers, some of them in Chinese and others in the vernacular. Romances of this period were generally written by women, in the vernacular; the best of these are *Makura-no-Soshi*, by Sei Shonagon, and *Gemji Monogatari*, by Murasaki-Shikibu. From the end of XII. until the beginning of XVII. cent. Japan was under military control, and so constantly engaged in civil war that there was little opportunity for literature to flourish; yet one or two historical works were produced, of which most important were the *Heike* and the *Jinkoseitoki*; and during the Ashikaga Shogunate the 'No.' or drama, originated.

The influence of literature and the drama on the national character can hardly be overestimated; novelists and playwrights alike aim at leaving a deep impression, generally of a moral nature, on the minds of their public; they are timid of realism in fiction. There are many daily newspapers in Japan, including a number of 'Yellow' papers, which have a greater sale than the larger and more politically important journals.

Art.—The keynote of Jap. art is impressionism. The painter sets himself to express the massed grandeur of mountains, the rush of torrents, the flight of birds, the pliancy of trees and plants, the strength and grace of animals, etc. The fundamental difference in the outlook of the painters of East and West is that to the latter mankind is the center of the universe; while to the former the universe itself is his subject. With us landscape art is the invention of recent times, but in the East it has afforded the artist one of his chief means of expression for a thousand years. Therefore, the slightest sketch of a master, be it figure or bird, or a few leaves, never fails to suggest its part in the visible universe.

In the beginning the art was borrowed from China, and dates from the introduction of Buddhism; but in Kanaoka, 928-87, there arose a native artist who broke from the trammels of the Chin. school and became, in fact, the founder of Jap. art. Since that time various influences have been at work. Thus in the XVII. cent. Matabei, 1578-1650, started the Ukioye, or popular school, taking his subjects from the daily life of the people. The XX. cent. is a period of transition. Famous artists are dealt with under their names.

The arch. of Japan is also derived from that of China; before the introduction of Chin. civilization in the VI. cent. all buildings were of the most primitive kind; but after the establishment of the Buddhist religion many fine temples were built, although private houses remained very simple in construction. Wood is generally used for the walls, and the heavy roofs are tiled; but interest attaches more to the decoration of the buildings than to the general architecture.

The town of Nikko is famed for its temples and shrines, which are visited annually by many thousand pilgrims; the principal temples are the old Buddhist temple, 716, and those of Iyeyasu and Iyemitsu, which are ornamented with wonderful painted carvings and contain many beautiful bronze figures and some fine lacquer frescoes.

Sculpture in stone is not of great importance, but numerous statues cast in bronze or carved in wood show great artistic merit. The finest image of Buddha stands in a grove near the temple of Hachiman at Kamakura; it is in bronze, is nearly 50 ft. high, and was cast in 1251. A still larger and much older image of the god stands in the park at Nara, but is not generally considered so artistic a masterpiece.

The decorative arts have flourished for many centuries; these include very beautiful china, cloisoñné enamel, lacquer work, and wonderful embroideries. The manufacture of china dates from the XIII. cent., and shows the influence of both China and Korea; and although Japan does not on the whole reach the standard of China in this particular, she has yet produced many varieties of great artistic excellence. The most celebrated is Satsuma ware, an enamelled crackled china of which very few genuine old specimens are to be found outside Japan. Other well-known varieties are Banko, Hizen, Kutani, and Owari. Towards the close of XIX. cent. a great deal of very inferior china was manufactured for export to the Western world; but now some very fine work is being produced.

Cloisoñné enamel as a Jap. manufacture, dates only from the XIX. cent., but many specimens of unusual excellence have been produced. Lacquer work has been an important industry since very early times, and during the XVII. cent. reached a perfection which has in no other country been attained. Embroidery has also reached a very high standard; and many of the most beautiful examples are so perfectly finished, and executed with such regard for perspective, as to resemble paintings. Jap. inlaid metal work is very highly thought of by connoisseurs.

JAPANNING, art of coating metal, wood, papier-maché, etc., with varnish, so as to resist heat.

JAPHETH, according to *Genesis* 9^{27}, *s.* on Noah; believed to be ancestor of peoples of W. Asia.

JARKENT (*c.* 44° N.; 80° E.), town, Semiryechensk, W. Turkestan. Pop. 17,000.

JARNAC, a town in W. France, dept. Charente, on the r. b. of the R. Charente, seven miles S.E. of Cognac. Brandy, wine, and wine casks are manufactured. Louis, Prince de Condé, was killed here in the victory of the Duke of Anjou over the Huguenots, March 13, 1569. Pop. 4,493.

JARO (10° 51′ N.; 122° 41′ E.), town, Panay, Philippines. Pop. 11,000.

JAROSLAV, (1) city and archiepiscopal see, Russia (57° 38′ N., 40° E.), on Volga, 155 m. N.N.E. of Moscow; manufactures cotton, tobacco, and flour; XIII. cent. cathedral; cap. of independent principality, 1026-1471. Pop. 72,000. (2) Tn., Galicia, Poland (50° N., 22° 54′ E.), on riv. San; captured by Russians, Sept. 22, 1914; passed to Poland on signature of Peace Treaty, 1919. Pop. 24,100.

JARRAH WOOD, hard timber of Australian eucalypt used for paving blocks, railway sleepers, etc.

JARROW (54° 59′ N.; 1° 28′ W.), town, Durham, England; industrial center; monastic remains, associated with Venerable Bede. Pop., 1919, 33,732.

JASHAR, BOOK OF, a lost book, the nature of which is uncertain; referred to in *Joshua* 10:3, and *2 Samuel* :1^{18}; possibly a book of songs.

JASHPUR (*c.* 22° 50′ N.; 84° E.), feudatory state, Central Provinces, India. Pop. *c.* 134,000.

JASMIN, JACQUES (1798-1864), Provençal poet of lowly birth; wrote in Provençal simple, popular songs, and was at last made *Maistre es Jeux* by Academy of Toulouse; not connected with Fèlibrige movement, for which he prepared way.

JASMINE, OR JESSAMINE (*Jasminum*), a genus included in the *Oleaceæ* and comprising a number of erect or twining shrubs with opposite or alternate leaves; often cultivated for their fragrantly scented flowers, and for ornamental purposes (*e.g. J. grandi-florum*). From the blossoms is extracted an essential oil used in perfumery.

JASON.—(1) In Greek mythology the leader of the Argonauts; was a *s.* of Æson, King of Iolcus. His *half-bro.* Pelias, drove him from the kingdom and he was educated by the Centaur Chiron. Pelias was warned by oracle against the man *with one sandal.* When J. came to claim his kingdom, he entered the market-place with one sandal, and Pelias, recognizing the omen, sent him in search of the golden fleece. J., by the

help of Medea, secured the fleece and returned with her in the *Argo*. Medea, pretending to restore youth to Pelias, persuaded his *daughters* to dismember him and place the members in a cauldron. Thus Pelias perished. J. and Medea were expelled from the kingdom. Finally J. forsook Medea for Glauce, and Medea in revenge slew the new bride and her own children by J. (2) A tyrant of Pheræ (fl. 390 B.C.),; he extended his power over the whole of Thessaly, and would probably have become supreme in Greece had he not been assassinated in the height of his power, 370 B.C.

JASPER, a crypto-crystalline form of silica, usually opaque through contained argillaceous matter. It is related to flint, chert, and chalcedony, and is found in veins and cavities in igneous rocks from which it is derived by decomposition. Through the admixture of oxides and silicates of iron its colors vary from red, brown, yellow, to green.

JASSY, cap. of dep. of same name, Rumania (47° 10′ N., 27° 37′ E.), on riv. of Pruth; see of Gr. Orthodox and R.C. bishops; univ.; trade in cereals, petroleum, salt, metals, fruits, wine, cattle; was cap. of Moldavia down to 1859; peace concluded here between Turkey and Russia, 1792; seat of Rumanian government while Falkenhayn was overrunning the country, 1916. Pop. 80,000.

JASTROW, JOSEPH, (1863) a Polish-American psychologist; *b.* in Warsaw, Poland. He came to this country as a youth and graduated from the University of Pennsylvania, later continuing his studies at Johns Hopkins University. Since 1888, he has been professor of psychology at the University of Wisconsin. He is rated as one of the highest authorities in his own field and has written books of international reputation. Among these are: *Time-Relations of Mental Phenomena, 1890*; *Fact and Fable in Psychology, 1900*; *The Subconscious, 1906*; *Character and Temperament, 1915*; and *The Psychology of Conviction, 1918.*

JASTROW, MORRIS (1861-1921) a Polish-American university professor; *b.* in Warsaw, Poland. He came to the United States in 1866, and graduated from the University of Pennsylvania in 1881, later studying abroad. On his return he became professor of Semitic languages and librarian in the University of Pennsylvania. He came to be recognized as one of the leading authorities on Semitic languages, religions and literature. Among his works are: *The Religion of the Babylonians and the Assyrians, 1898*; *Hebrew and Babylonian Traditions, 1914*; *The War and the Coming Peace, 1918*; and *Zionism and the Future of Palestine, 1919.*

JASZBERENY (47° 29′ N., 19° 57′ E.), town, Jasz, Hungary; wine, cloth manufacture; agricultural center. Pop. *c.* 26,000.

JATAKA, name of the many stories of incarnation of Buddha, and of a particular collection of J's known to have been made not later than the III. cent. B.C. This collection is an important source for the history of folklore and fable. 'Æsop' deriving much from it.

JAITH.—(1) (17° N., 75° 12′ E.); native state, Bombay, India. Pop. *c.* 70,000. (2) (17° 4′ N., 75° 11′ E.), town, capital of above. Pop. 6,000.

JATIVA, SAN FELIPE DE JATIVA (39° 24′ N., 0° 53′ W.), town, Spain; wine, fruit. Pop. 13,000.

JAUNDICE, term applied to a condition in which the skin and other parts of the body are yellow in color, accompanied by other symptoms, due to the circulation of bile in the blood, and to its absence from the intestines preventing the proper digestion of food. It may be due to obstruction of the bile duct by (1) foreign bodies, *e.g.* gall-stones or hydatids; (2) stricture of the duct; (3) catarrhal inflammation, with exudation of the duct or of the duodenum; (4) tumors within or at the opening of the duct; (5) pressure from tumors in the liver or other organ; or it may be due to other causes, such as (1) the toxins of certain fevers, or of pyæmia, poisoning by snake poison, phosphorus and certain other mineral poisons, chloroform; (2) nervous derangements, *e.g.* concussion or fright; (3) absorption of bile into the blood through habitual constipation; (4) undue secretion through congestion of the liver.

JAUNPUR (25° 40′ N., 82° 30′ E.), district, United Provinces, India; area, *c.* 1,552 sq. miles. Pop. *c.* 1,220,000. Chief town, *Jaunpur* (25° 44′ N., 82° 43′ E.), has fine mosques, ruined fort; formerly capital of Muslim kingdom; manufactures perfumes. Pop. *c.* 43,000.

JAUNTING-CAR, one-horse vehicle, in which passengers sit at right angles to horse; used in Ireland; drivers known as 'jarvies.'

JAURÉS, JEAN (1859-1914), Fr. Socialist writer, orator, and leader; became prof. of philosophy at Toulouse Univ., 1883; was elected to Chamber of Deputies, 1885, and was a member of the legislature with two breaks, 1889-93 and 1898-1902, until his death. He championed workmen in Carmaux strike.

1892, took leadership of Socialists in the Chamber, and fought hard for Dreyfus, 1902. He was assassinated on July 31, 1914. Among his works were *Action Socialiste*, *Histoire Socialiste*, and *Etudes Socialistes*.

JAVA, isl., belonging to Holland, E. Indies (7° 20′ S., 109° 55′ E.), lies to S.E. of Sumatra, and is bounded N. by Java Sea and Borneo, E. by Bali Strait, S. by Ind. Ocean, W. by Strait of Sunda. S. coast is inaccessible owing to the surf, and from it the surface rises steeply to the line of volcanic mountains which run from end to end of island. There are many active volcanoes, some of the peaks reaching heights of 10,000 to 12,000 ft.; among highest peaks are Smeru, Gedeh, Sumbing. Along the N. are fertile alluvial plains. Rivers, short and commercially unimportant, include Tji Manuk and Tji Tarun.

Long before its existence was known to Europe, Java had attained a considerable degree of civilization under Hindus, who founded here several independent states. Under them Buddhism and Sivaism became in turn the prevailing religion, traces of both being seen in the numerous Hindu temples which still exist. In XV. cent. the island gradually became Mohammedan; visited from about 1520 by Port. traders, who were overcome by Dutch. about 1596. Dutch carried on long warfare with natives, and gradually obtained possession of most of the island, acquiring Preanger regions, in 1705, and Bantam, in 1808. During Napoleonic wars, Java, with rest of Dutch possessions, was incorporated in Fr. Empire. It was taken by British, in 1811, and occupied by them until 1817, when it was restored to Holland. In 1825, rebellion against Dutch rule was led by Depa Negara, who was ultimately defeated and exiled in 1830. Since then various unsuccessful risings have taken place, but Dutch control is now practically complete, although the native states of Jukjakarta and Surakarta are nominally independent.

Java's chief source of wealth lies in its rich vegetation. The mountains are covered with trees to heights of 10,000 ft. Forests occupy probably one-fifth of the whole surface, and produce valuable teak, coco-nuts, palms, bamboos, spice trees. Cultivated products include rice, sugar, coffee, indigo, tea, cinchona, tobacco, rubber. Minerals include petroleum, coal, salt, sulphur. Exports, chiefly to Netherlands, are sugar, coffee, tobacco, cinchona, quinine, tea, copra, indigo, kapok, hides, teak, tin. Imports include cottons, cutlery, hardware, ground-nut cake, bean cake. Trade is mainly carried on by Arabs and Chinese, the native inhabitants being engaged chiefly in agriculture. There are few industries, the most important being the manufacture of coarse cloth, mats, and soap. See Map of E. Indies Islands.

Principal towns are Batavia (cap.), Semarang, Surabaya, and Surakarta. Climate, unhealthy in low-lying districts, is hot and damp, but heat is tempered by regular sea breezes. Average temp. in lower parts is 78° F.; rainfall about 75 in. Java, with Madura, is divided for administrative purposes, into seventeen residencies, each of which is controlled by a Resident, who is assisted by various minor officials. Supreme executive authority is vested in gov.-gen. of Dutch India, appointed by the crown; legislative power also rests with him, assisted by a council of five members. There is complete religious liberty; prevailing belief, Mohammedanism.

There is a distinct Javanese language, of which various dialects are in use. Old language called Kavi is that of early Javanese literature, of which there is a considerable amount. Modern Javanese literature is unimportant. The natives are of three distinct races of Malayan stock—the Javanese themselves, the Sundanese in W., and Madurese in E. They are brown in color, with prominent cheek-bones and thick lips. Foreign inhabitants include Chinese, Arabs, and Europeans. Area, *c.* 48,500 sq. m. (with Madura, 50,557, sq. m.); pop., including Madura, 34,157,300.

JAVELIN, spear for casting by hand or with twisted thong; term less frequently used for stouter thrusting spear or pike. J.-throwing as a sport revived in modern Olympic Games.

JAWHAR (73° 20′ E. 19° 55′ N.), town and native state, Bombay, India. Pop. *c.* 50,000; of town, 4,000.

JAWOROW (49° 57′ N., 23° 3′ E.), town, Galicia, Austria. Pop. 11,000.

JAY. See under CROW FAMILY.

JAY, JOHN (1745-1829), American statesman, jurist and diplomat; *b.* in New York City. He graduated at King's College, now Columbia University, in 1764; was admitted to the bar in 1768, and speedily became one of the most influential figures in the colony. Though conservative in temperament, he was an ardent supporter of the Revolutionary cause. He served as a member of the Continental Congress, 1774-77, and was the president of that body, 1778-79. He wrote some notable state papers during his membership in Congress, which had a powerful effect upon public opinion. From 1777 to 1779, he was the chief justice of New York state. He represented

the United States in Spain, from 1779 to 1782. Although his diplomatic status was not acknowledged by that country, his stay was not unfruitful, for he prevented America from making unwise concessions to Spain in the matter of Mississippi River navigation. He was one of the negotiators of the peace treaty between this country and Great Britain, 1782-83, and to him belongs the chief credit of bringing negotiations to a successful close. Following his return to this country, he was secretary for Foreign Affairs, 1784-89, and was a powerful factor in securing the ratification by New York state of the Federal Constitution. When the National Government was organized, Jay was chosen as first chief justice of the United States Supreme Court, 1789, and held that position until 1795. Without relinquishing his office, he negotiated as envoy of the United States the treaty with the British Government, in 1794, generally known as the Jay Treaty. The treaty aroused widespread controversy, but was finally ratified by the Senate. From 1795 to 1801, he was Governor of New York, having been elected as a Federalist. After the latter date he lived in dignified retirement on his estate at Bedford, N.Y., until his death, in 1829.

JEAN CLOPINEL DE MEUN, MEUNG (*d. c.* 1305), Fr. poet; *b.* at Meun-sur-Loire; continued the *Roman de la rose* fifty years after Guillaume de Lorris had begun it, 1230. The first part was only an allegory of love (the rose), the second, 18,000 verses long, a kind of enclycopædia; its mirth, satire, and verbal excellence delighted France until well on into period of Renaissance.

JEANNE D'ARC. See JOAN OF ARC.

JEANNETTE, a borough of Pennsylvania, in Westmoreland co. It is on the Pennsylvania railroad. There are important industries, including the manufacture of window glass, table ware, rubber goods, etc. Pop., 1920, 10,627.

JEANNETTE EXPEDITION. See POLAR REGIONS.

JEBB, SIR RICHARD CLAVERHOUSE (1841-1905), Brit. classical scholar; *b.* Dundee; educated Cambridge; prof. of Greek, Glasgow, 1875; Cambridge, 1889; knighted, 1900; famous for his translations of Sophocles, Theophrastus, and other Gk. writers; a great humanist and a brilliant translator.

JEBEIL, JEBAIL (34° 8′ N., 35° 43′ E.), walled town, Syria. Pop. *c.* 3,000.

JEDBURGH (55° 29′ N., 2° 33′ W.), town, Roxburghshire, Scotland; ruins of beautiful Augustinian abbey founded by David I., XII. cent.; on site of old royal castle is disused county jail; manufactures tweeds, woolens. Birthplace of Sir David Brewster. Pop. 4,000.

JEDDO. See TOKIO.

JEEJEEBHOY, SIR JAMSETJEE, BART. (1783-1859), Parsi merchant and philanthropist; *b.* Bombay; in business partnership with his *father-in-law,* Framjee Pestonjee, at early age; amassed immense fortune by 1820, and gave away *c.* $1,500,000 in philanthropy between 1822 and 1858. First native of India to be made a baronet of United Kingdom, 1857.

JEFFERIES, RICHARD (1848-87); Brit. naturalist and author; made his first success with *The Gamekeeper at Home,* and later wrote many books on open-air subjects.

JEFFERSON, CHARLES EDWARD (1860), Clergyman; *b.* in Ohio. Bachelor of Science, 1882; Bachelor of Arts, 1886; Ohio Weslayan, 1882-1884; superintendent public schools of Worthington, Ohio, Doctor of Divinity, 1898; Pastor Central Church, Chelsea, Massachusetts, 1887-1889; since 1898, pastor Broadway Tabernacle, New York. Author of: *Quiet Hints to Growing Preachers in my Study, 1898; Doctrine and Deed, 1902; Things Fundamental, 1903; The Minister as Prophet, 1905; The World's Christmas Tree, 1906; The New Crusade, 1907; The Character of Jesus, 1908; My Father's Business, 1909; A Fire in the Snow, 1916; The Land of Enough, 1917; What the War Has Taught Us, 1919.*

JEFFERSON CITY, a city of Missouri, the capital of the state, and the county seat of Cole co. It is on the Chicago and Alton, the Missouri, Kansas and Pacific, and the Missouri railroads, and on the Missouri River. It is the chief trading and manufacturing center for several counties. Its industries include the manufacture of flour, shoes, farming implements, wagons, and iron products. Among the public buildings are the State Capital, Lincoln Institute, and St. Mary's Hospital. Pop., 1920, 14,490.

JEFFERSON, JOSEPH (1829-1905), a famous American comedian; *b.* at Philadelphia. His first notable appearance on the stage was as 'Asa Trenchard' in *Our American Cousin,* 1858. His most famous impersonation was in the rôle of *Rip Van Winkle,* which was a great success in America and in London. His other famous parts were as 'Bob Acres' in *The Rivals,* and as 'Caleb Plummer' in *The Cricket on the Hearth.* He has left an *Autobiography,* 1889.

JEFFERSON RIVER, a river of the U.S.A. It rises in S.W. Montana, and finally joins the Madison and Gallatin Rivers, the three streams forming the Missouri. It is about 150 m. long.

JEFFERSON, THOMAS (1743-1826), third President of the United States; *b.* in Albemarle co., Va. He studied two years at William and Mary College, Williamsburg, Va., after which he studied law, and for some years practiced. He was a member of the House of Burgesses when the revolutionary agitations began, and took a prominent part in the calling of the Continental Congress, to which he went as a delegate, and where he drew up the Declaration of Independence. During the Revolutionary War, he was Governor of Virginia, and in 1784, was sent as Minister to France. In 1789, he was President Washington's Secretary of State. When Washington retired, Jefferson and John Adams were candidates of opposing parties, Jefferson opposing Washington's policy of a strongly centralized government. Adams was elected President, and Jefferson, having the next largest number of votes, became Vice President. In 1800, Jefferson was again a candidate, and this time was elected President. The most important act of his administration was the purchase of Louisiana from France. At the end of his second term he retired. Jefferson, though he has written very little, is one of the past Presidents of the United States who ranks with Washington and Lincoln in having achieved international fame. No one has more truly enunciated the principles of political democracy.

JEFFERSONVILLE, a city of Indiana, the county seat of Clark co. It is on the Baltimore and Ohio Southwestern, the Pittsburgh, Cincinnati, Chicago and St. Louis, and other railroads, and on the Ohio River, 50 miles E. of Evansville. It is opposite Louisville, Ky., and is connected with that city by several bridges. It is the seat of the Southern State Penitentiary, and has a high school and a public library. Pop., 1920, 10,098.

JEFFREY, FRANCIS, LORD JEFFREY (1773-1850), Scot. judge and critic; educated at Glasgow and Edinburgh Univ's; advocate, 1774; edited the *Edinburgh Review* (Whig) from its foundation. 1803-29; Dean of the Faculty of Advocates, 1829; M.P. for Malton, 1831-32, and then for Edinburgh, 1832; Lord-Advocate, 1830-34; judge of the Court of Sessions, 1834; four vol's of contributions to the *Edinburgh*, pub. 1844.

JEFFREYS, GEORGE, FIRST BARON JEFFREYS (1648-89), Eng. Lord Chancellor; *b.* at Acton, Denbighshire; called to the Bar, 1668, and by his great skill in cross-examinaglon rose in his profession, becoming Recorder of London, 1678. After Monmouth's rebellion he was sent on Western Circuit to try the rebels, and at the 'Bloody Assizes,' which he opened at Winchester, in 1685, he condemned 320 persons to death. Soon afterwards he was made Lord Chancellor of England, but after the flight of James II. he was imprisoned in the Tower, where he died.

JEHOIAKIM (fl. *c.* 600 B.C.), *s.* of Josiah, King of Judah (*2 Kings* and *2 Chronicles*).

JEHOL, CH'ENG-TE-FU (40° 59′ N., 118° E.), town, Chi-Li, China. Pop. *c.* 10,000.

JEHORAM.—(1) succ. his *bro.* Ahaziah as king of Israel, *c.* 854 B.C.; wounded at Ramoth-Gilead, *c.* 842 B.C. (2) *s.* of Jehoshaphat, king of Judah, *c.* 850-843 B.C.; *m.* Athaliah, *s.* of Jehoram of Israel.

JEHOSHAPHAT, *s.* of Asa, king of Judah, *c.* 874-850 B.C.; *f.* of Jehoram.

JEHOVAH, the proper name of the God of Israel. It is now agreed that it should more properly be called *Jahweh*, the form *Jehovah* having arisen through the addition to the consonants of the vowels of *Adonai* (Hebrew, 'My Lord'), as Jahweh itself being too sacred was not pronounced. When the Jews read the Scriptures aloud, it was always read 'Adonai.' In the Eng. versions it is rendered 'The Lord,' though this somewhat obscures the fact that it was originally the name simply of a tribal deity. According to *Exodus* 3^{14}, the name was revealed to Moses on Mount Hebron (according to E); *Exodus* 6^{3} (P) also gives an account of its revelation to Moses in J. it is used from the begining (E and P have Elohim, 'God,' in *Genesis*); thus there were varying traditions of its origin. Its etymological significance is disputed, but it is probably from the verb *hayah* (to be), and means *the self-existent* or *unchangeable One*, the *One who is.*

JEHU, *s.* of Jehoshaphat; king of Israel, *c.* 842-816 B.C.; supported by the prophet Elijah.

JELLACHICH, JOSEF, COUNT (1801-59), Croatian general; took part in crushing Hungarian rebellion, 1848.

JELLICOE OF SCAPA (JOHN RUSHWORTH JELLICOE), FIRST VISCOUNT (1859), Brit. sailor; entered navy in 1872, and won special prize for gunnery as a lieutenant; served at Tell-el-Kebir and Alexandria in Egyptian

War, 1882; was a commander on *Victoria* when she was sunk by *Camperdown* off Tripoli, 1893; commanded Naval Brigade during relief expedition to Peking, 1900, acting as chief of staff to Vice-admiral Sir E. Seymour. He was director of Naval Ordnance, 1905-7; was made a rear-admiral in 1907, and a lord commissioner of the Admiralty in 1908; commanded successively the Atlantic Fleet, 1910-11, and the second squadron Home Fleet, 1911-12; was second sea lord of the Admiralty, 1912-14. In 1911, he was knighted.

Shortly after outbreak of the World War, Sir John Jellicoe was placed in command of the Grand Fleet, being created a full admiral in 1915. In this capacity he was in supreme command of the Brit. fleet at the battle of Jutland, the greatest clash of sea forces in the history of the world (see JUTLAND, BATTLE OF). He was appointed first sea lord of the Admiralty, in Nov., 1916, for the purpose of coping with the Ger. submarine menace; established anti-submarine division of naval staff. Introduced towards end of 1916, 'protected sailings' on the Scandinavian convoy; extended similar protection to Fr. coast trade, March, 1917, and to Atlantic trade, May, 1917. Became chief of the Naval Staff, in May, 1917, retiring in Dec., 1917, and being raised to the peerage. Wrote *The Grand Fleet, 1914-16; its Creation, Development, and Work*, followed in 1920 by *The Crisis of the Naval War*.

JELLIFE, SMITH ELY (1866), an American neurologist; *b.* in New York City. He graduated from the College of Physicians and Surgeons, of Columbia University, in 1889, then went abroad to continue his studies there. During 1907-12, he was clinical professor of mental diseases at Fordham University; adjunct professor of the diseases of the mind and the nervous system, at the Post Graduate Hospital and Medical School, 1911-17; and consulting neurologist at the Manhattan State Hospital in Tarrytown, N.Y., since then. Since 1902, he has been managing editor of the *Journal of Nervous and Mental Diseases*. Among his many works are: *Essentials of Vegetable Pharmacognosy, 1896*; *Morphology and Histology of Plants, 1899*; *Outlines of Pharmacognosy, 1904*; and he has revised *Butler's Materia Medica, 1902*.

JELLY, the solid state of matter produced by the addition to a liquid of some colloid substance, *e.g.*, gelatine. A distinguishing feature of J. is its elasticity. J's are much used as an article of food, and are eaten as sweets or savories.

JELLY-FISH, bell-shaped or disc-shaped marine hydrozoa, embracing Medusæ, Ctenophora, and Siphonophora. In the Medusæ the body is shaped like a bell or a parachute. The body is bordered by a fringe of writhing tentacles, supposed to resemble the snake-locks of the gorgon Medusa—hence the name. The animal normally swims with its subumbral surface downwards. The distinguishing feature of the J. is the misogloe, a diaphanous and gelatinous secretion layer, situated between the extoderm and the endoderm, and developed in great quantity. On the subumbral surface is the mouth, bordered by four lips which bear stinging threads. The mouth leads into the stomach. From the stomach the radial canals lead to the edge of the umbrella; these are blue, and in the *Aurelia aurita* are sixteen in number, eight being simple, and eight branches. These meet a ring canal which runs round the edge of the umbrella. The nervous system follows a ringed course round the umbrella. In the typical Aurelia, the sex organs are seen hanging from the subumbral cavity in four fans. The muscular system is arranged in a circular formation on the under surface of the umbrella. The muscles contract and the water is thereby pumped from the subumbrella, and the animal is jerked upward. This is the only means of locomotion. Medusæ seize their prey by their tentacles; the victim becomes paralyzed and is drawn into the mouth. Medusæ are either male or female; hermaphrodites are found, but are rare.

JEMAPPES (50° 26′ N., 3° 53′ E.); town, Belgium; French defeated Austrians, 1792; coal center. Pop. 12,500

JENA (50° 54′ N., 11° 35′ E.), town, Saxe-Weimar, Germany. Univ. dates from 1558. Schiller's *Wallenstein* and Goethe's *Hermann and Dorothea* were written here; town also has associations with Luther, Fichte, Hegel, Humboldt, Haeckel. Here Napoleon defeated Prussians, 1806. Pop. 41,000.

JENATSCH, GEORG (1596-1639), Fr. Prot. pastor and soldier; fought against the Catholic Planta family; became governor of Valtelline; murdered at Coire.

JENGHIZ KHAN (1162-1227), Mongol emperor, and one of greatest conquerors of world; *b.* near river Onon, Mongolia; originally named Temujin; succ. to Mongol throne in 1175; after consolidating the various Mongolian tribes, he twice overran China; conquered Chinese states Hia and Kin, 1208-14. His envoys to Transoziana having been killed, he started, in 1219, on his great career of conquest; looted Bokhara and Merv, and conquered Herat and

other towns; drove the Turks into S.E. Europe, while his armies successfully ravaged S. Russia and N. India; *d.* while overrunning China for the third time.

JENKS, ALBERT ERNEST (1869), Anthropologist; *b.* in Michigan; 1896, Bachelor of Science, Kalamazoo College; 1897, Bachelor of Science, University of Chicago; 1899, Doctor of Philosophy, University of Wisconsin; 1900-1901, economic editor *American Thresherman*; 1901, assistant ethnologist; 1902, ethnologist, Bureau American Ethnology, Washington; 1902, assistant chief Bureau of Non-Christian Tribes, Philippine Islands; 1904, chief ethnologist department Philippine exhibition of St. Louis Exposition; 1904, University of Wisconsin special lecturer on Philippine ethnology; 1906-1907, assistant professor sociology; since 1907, professor anthropology; 1915-1918 chairman of Department Sociology and anthropology, chairman of Department of Anthropology and director of Americanization course since 1918. Author of: *The Childhood of Jishit, the Ojibwa, 1900*; *The Wild Rice Gatherers of the Upper Lakes, 1901*; *The Bontoc Igorot, 1905*; *Ba-long-long, the Igorot Boy, 1907*. Wrote articles for scientific journals.

JENKS, JEREMIAH WHIPPLE (1856), an American political economist; *b.* in St. Clair, Mich. He graduated from the University of Michigan, in 1878; was admitted to the bar, in 1881, but instead of practicing law, took up the profession of teaching. He was professor of political science and English literature at Knox College during 1886-9; professor of political economy and social science at Indiana University during 1889-91; professor of political economy and politics at Cornell University during 1891-12, and professor of government and director of the division of public affairs, 1912-17, since which he has been research professor of government and public administration. In his own field Prof. Jenks stands as one of the highest authorities, whose services have been in frequent request, not only by the United States Government, but by foreign governments as well. In 1903, he was expert advisor to the Mexican Government in currency reform, serving the Chinese Government in the same capacity a year later. Among his many works are: *The Trust Problem, 1900*; *The Political and Social Significance of the Life and Teachings of Jesus, 1906*; *The Immigration Problem* (with Wm. Jett Lauck), *1913*; *Business and the Government, 1917*; and *Great American Issues, 1921*.

JENNÉ (13° 4′ N., 5° 39′ W.), walled and fortified town, Fr. W. Africa; trading center; boat-building. Pop. *c.* 8,000.

JENNER, EDWARD] (1749-1823) Eng. physician, the discoverer of vacci nation; was *b.* at Berkeley, Gloucester shire, 1749; third *s.* of Rev. Stephen J. vicar of the parish, and rector of Rock hampton; ed. at Wotton-under-Edge and Cirencester; became apprenticed to Dan iel Ludlow, a well-known surgeon a Sudbury, near Bristol, proceeding after wards to London to live with (for two years) and study under John Hunter He commenced the practice of med. i his native place, in 1773, and had con siderable success, also carrying out in vestigations in biology. He obtained the degree of M.D. from St. Andrews, i 1792. In his native county there was a popular belief that persons who had suf fered from cow-pox could not contrac small-pox, and, after much investigation J. became of the opinion that cow-pox 'grease' in horses, and small-pox were al types of the same disease, modified unde different conditions. He carried out care ful researches on the subject for sixteen years, and at length, in May, 1796, h innoculated a boy, James Phipps, wit cow-pox, so that, when the boy was in noculated with small-pox, in July, a attack of the latter disease did not ensue This experiment was followed by others and in 1798 J. published the result of hi investigations. He met with much oppo sition from the public and from many members of the medical faculty, but re ceived support from many eminent phy sicians and surgeons, and honors were showered upon him by foreign sovereign and learned societies at home and abroad the College of Physicians being, however a notable exception. He received grant of $50,000 and later of $100,000 fro Parliament.

JENNER, SIR WILLIAM, BART (1815-98), Eng. physician; prof. of Pathology, 1849, and afterwards of Clinic Med. and Med. at Univ. Coll., Londo pres. of Coll. of Physicians, 1881-88; was the first to distinguish typhus fro typhoid fever.

JENOLAN CAVES (*c.* 149° 40′ E., 3 20′ S.), stalactite caves, N.S.W., Au tralia.

JENSEN, ADOLF (1837-79) Ge composer, famous for song-writing.

JEPHTHAH, Israelite judge; *s.* Gilead (*Judges 11, 12*).

JERBA (33° 45′ N., 10° 50′ E.), islan Gulf of Gabes off Tunisian coast, Afric area, 425 sq. miles; sponges, dates, olive woolens. Pop. *c.* 40,000.

JERBOAS, small terrestrial and no turnal rodents with exceedingly lo hind legs and tail; found burrowing

the desert plains of Europe, Asia, and Africa; relatives, *Jumping Mice* (*Zapus*), are Amer.

JEREMIAH, Old Testament prophet; received his call in the time of King Josiah, *c.* 626 B.C.; he played a prominent part in the religious and political history of Israel from 604, when the Assyrian power under Nebuchadnezzar conquered the Egyptians at Carchemish. J. saw that it was best that Israel should yield to Assyria, but his word was not heeded, with the result that the nation went into captivity, and J. after various sufferings was carried off to Egypt. The book of J. is the longest and one of the greatest of the prophetical books. It is probably largely the work of J. himself, but to some extent recast, and the arrangement is often unchronological.

JERÉZ DE LA FRONTERA, formerly *Xeres* (36° 40′ N., 6° 8′ W.), town, Spain; center of sherry trade. Pop. 65,000.

JERÉZ DE LOS CABALLEROS (38° 15′ N., 6° 48′ W.), town, Spain. Pop. 10,500.

JERICHO, vil., Palestine (31° 23′ N., 35° 46′ E.); taken by Israelites under Joshua; in later times destroyed by Romans; rebuilt by Hadrian; finally ruined during Crusades. In World War, captured by Brit. forces, on Feb. 21, 1918.

JEROBOAM (*s.* of Nebat), king of Israel; first of northern kingdom, *c.* 932-912 B.C., on rupture after death of Solomon, J. refusing to acknowledge Rehoboam; denounced later as one who 'made Israel to sin.'

JEROME, JEROME KLAPKA (*b.* 1859), an English author, educated at the Philological School, Marylebone, London. He was by turns school-master, clerk, and actor before he took up journalism. He made his reputation as a humorist in 1889, with *Idle Thoughts of an Idle Fellow* and *Three Men in a Boat*; and from 1892 to 1897, he was co-editor of *The Idler* with Robert Barr. He was also editing *To-Day* at the same time. In 1886, a one-act play of his, *Barbara*, was put on at the Globe Theatre. This was followed by many others, including *The Passing of the Third Floor Back*.

JEROME OF PRAGUE (*d.* 1416), Bohemian theologian; studied at Prague, Oxford, Paris, Cologne, and Heidelberg; an admirer of Wycliffe, and friend of Huss; got into trouble with the authorities of the Church; arrested, 1415; imprisoned and recanted; afterwards defended his former positions, and was burnt as a heretic.

JEROME, ST., HIERONYMUS (340-420), doctor of the Church; ed. Rome; spent his life in Gaul, the East, and at Rome, as fellow-worker with Pope Damasus. J. was a scholar rather than a saint, and his great work was his translation of the Bible into Lat.—the Vulgate, in use in the West since his days. He began in 383 by revising the existing Old Lat. versions of the Gospels, of which there were several, then the rest of the New Testament, then the Old Testament, finished *c.* 404. He also wrote commentaries, **letters**, controversial works, etc.

JERROLD, DOUGLAS WILLIAM (1803-57), Brit. dramatist, wit, and man-of-letters; became a dramatic critic; and in 1829, produced his famous *Black-Eyed Susan* at the Surrey Theatre; contributed to *Punch*, in his characteristic light vein. His *Mrs. Caudle's Curtain Lectures* enjoyed a great vogue.

JERSEY (49° 13′ N., 2° 7′ W.), largest of Channel Islands, belonging to United Kingdom; area, 45 sq. miles; surface undulating, mostly cultivated; potatoes, apples; good fishing; famous strain of cattle; butter produced. Chief town, St. Helier. J. is administered by lieut.-gov. and bailiff nominated by Crown. Pop., 1921, 49,494.

JERSEY CITY, a city of New Jersey, in Hudson co., of which it is the county seat. It is on the Pennsylvania, the Erie, the Lehigh Valley, the New Jersey Central, the Baltimore and Ohio, West Shore, the New Jersey and New York, and the Lackawanna railroads, and on the Hudson River and the Morris Canal. It is opposite New York City, with which it is connected by ferries and tunnels. The business part of the city lies on the level area along the river bank. W. of this is a sharp bluff on which is the residential part of the city. Jersey City is the second city in population of the state. It has many important public buildings and its institutions include a public library, St. Peter's Roman Catholic College, several hospitals, and public high schools. Its business interests are closely connected with those of New York City. It is the terminus of several large railroad and steamship lines, and its commerce is very extensive. It has large stock yards, slaughter houses, grain elevators, and meat packing establishments. Its industries include iron and steel products, machinery, locomotives, fire works, furnaces, jewelry, paints and chemicals, zinc goods, soap, etc. It has three national banks, and several private banks and trust companies. The city was first known as Paulus Hook, and was first settled in 1840. It was incorporated

in 1838, and was enlarged by the annexation of Hudson and Bergen, in 1870, and by Greenville, in 1872. It received a new charter in 1899. Pop., 1920, 297,864.

JERSEY SHORE, a borough of Pennsylvania, in Lycoming co., 12 miles N.W. of Williamsport. Its industries include railroad shops, foundries, and cigar manufactories. Pop., 1920, 6,103.

JERUSALEM, a city of Judæa, and cap. of Palestine, situated 31° 46′ N. lat., and 35° 13′ E. long. It stands on a platteau formed of two hills, and bounded both E. and W. by valleys, that on the E. being the brook Kidron referred to in the N.T. To the N. there are also two valleys. The generally exact idea of the geography and geology of J. is due to a succession of investigations which commenced in 1833. Since that time the work has gone on under various investigators of whom the most prominent are De Vogüé, 1860-63; Capt. Wilson, R.E., 1866; Capt. Warren, R.E., 1867-70; and Lieut. Conder, R.E., 1872-75. Still more results have been obtained by the Palestine Exploration Fund which commenced work in 1894, but the work is yet by no means finished. Its earliest inhabitants, the Jebusites, were defeated by Joshua and David; latter made it his cap., fortified it, and selected situation for temple, built in Solomon's reign. After separation of Israel and Judah, Jerusalem was frequently engaged in war against kings of Israel, and suffered successive attacks by Egyptians, Philistines, Assyrians, and Babylonians; taken and sacked by Nebuchadnezzar, King of Babylon, in 588 B.C., when chief inhabitants were carried off to Babylon. First return of exiles under Zerubbabel occurred *c.* 536 B.C.; new temple was completed by 515 B.C.; and under Ezra and Nehemiah the city was rebuilt in V. cent., B.C.

For many years it knew no peace; was captured in succession by Persians, Macedonians, Syrians, and Egyptians; sacked by Ptolemy Soter of Egypt; only regained independence for brief period under the Maccabees, *c.* 165 B.C.; came under sway of Rome in 37 B.C., and flourished under Herod; destroyed by Titus, A.D. 70, and again by Julius Severus, A.D. 132; rebuilt under Hadrian, with name of Ælia Capitolina; sacked by Chosroes II. of Persia, 614; captured by Mohammedans, 637, from whom it was taken by the Crusaders, under Godfrey de Bouillon, in 1099; recaptured by Saladin, 1187, remaining subject to Egypt till 1517, since when it belonged to Turks till 1917. Jerusalem is episc. see of Anglican, Greek, and R.C. Churches; site of several monasteries; among notable buildings are Church of Holy Sepulchre (said to occupy site of our Lord's tomb), Mosque of Omar, and Russian cathedral. Large quantities of souvenirs (rosaries, crosses, etc.) are made for tourists and pilgrims, on whom the city largely depends for its prosperity. In the World War, Jerusalem was surrenderd to Allenby, on Dec. 9, 1917 (see PALESTINE). The city has now been placed under a separate governor, and schemes for restoration have been elaborated.

JERUSALEM, SYNOD OF (1672), on behalf of the Eastern Church denounced Calvinism.

JESI (43° 32′ N.; 13° 13′ E.); town, Italy; seat of bishopric. Pop. 24,000.

JESSE, *f.* of David, king of Israel, and therefore in the New Testament genealogies an ancestor of Christ.

JESSORE.—(1) (23° 10′ N., 89° 8′ E.), district, Bengal, India; area, 2,925 sq. miles; produces sugar, timber, rice. Pop. *c.* 1,800,000. (2) (23° 8′ N., 89° 8′ E.), town, capital of above. Pop. 9,000.

JESTER, prominent member of mediæval society; retainer in noble households, where they were expected to make jokes to order; best description of J. is Touchstone in *As You Like It*.

JESUITS, a famous religious community of the R.C. Church, founded, 1540, by a Span. soldier, St. Ignatius of Loyola. It came into existence, first as a band of missionaries destined for the conversion of the Turks, then, as the practical impossibility of this task became apparent, it broadened into a society, whose work it should be to become a weapon, adaptable for every purpose the Church might need. To secure this object the more effectively, every outward sign of an especial Order with an especial aim was omitted. Monastic life and monastic habit alike were given up. To the triple vow, taken in all religious communities of the R.C. Church (poverty, chasity, obedience), St. Ignatius added a fourth, that of going without question or delay wherever the pope might see fit to send them for the salvation of souls. This was taken for the first time on Aug. 15, 1534. Soon after, 1540, a definite rule was composed and presented to Paul III. By a Bull, dated Sept. 27, 1540, Paul III. solemnly confirmed the new 'Company of Jesus,' and in April, 1541, St. Ignatius was elected the first General. His *Book of Constitutions* (first pub. 1558) shows the purposes of the society, his *Spiritual Exercises* its inward force and efficacy.

It is natural that the organization of Loyola should be military and autocratic,

with all the advantages and disadvantages of such a system. The obedience demanded (save in matters of sin) is absolute. The General has practically unlimited power, though he can be deposed by a General Congregation of the whole society. The various grades into which the Order is divided are—(*a*) *Professed*, who, after several years, have been admitted to final vows. From these only can the Superiors and Professors of Theology be chosen; (*b*) *Coadjutors*, whether priests or lay-brothers, who carry on the affairs of the society; (*c*) *Scholastic*, who in their study and preaching are preparing themselves for the priesthood and their future work; (*d*) *Novices*, who by purely manual and spiritual tasks are being trained and tested. The work of the society has been, through the influence of Claudio Aquaviva—General, 1581-1615—mainly educational and missionary; but preaching, natural science, and theology owe much to Jesuit enterprise. In the last-named department, the society has always learned to the broadest interpretation of moral principles, and thus gave color to the brilliant attack of Pascal's *Provincial Letters*, the effects of which have been felt till our own day.

Its force and military organization made it feared and hated by political rulers, and it has been repeatedly suppressed in various countries of Europe. After a career of splendid success and triumphs, both missionary and intellectual, it became so unpopular that, 'for the peace of the Church,' Clement XIV., by a Bull of July 21, 1773, *Dominus et Redempter Noster*, without approving or denying any of the charges made against the society, suppressed it in all the states of Christendom. But it was too useful and too powerful to suffer anything more than a temporary eclipse, and it was reestablished by Pius VII., Aug. 7, 1814—*Solicitudo Omnium Ecclesiarium*. It is still forbidden in certain countries of Europe—Germany, Switzerland, Portugal, etc. In England its work is mainly educational, with colleges of Stonyhurst, Beaumont, etc.

JESUP, MORRIS KETCHUM (1830-1908), an American philanthropist; *b.* in Westport, Conn. As a youth he entered the banking business, retiring, in 1884, after having amassed a large fortune. His money he devoted to many public benefits. He was one of the founders of the Young Men's Christian Association, and he gave $100,000 to the Women's Hospital and similarly large sums to Yale University and Williams College. He was most widely known, however, on account of his deep interest in Arctic exploration, giving strong backing to such expeditions, among them being the Jesup North Pacific Expedition.

JESUS CHRIST ('Jesus' is a personal name; 'Christ,' 'The anointed One,' a title) was *b.* between 8 and 4 B.C., and crucified at Jerusalem between 29 and 37 A.D. Despite all the ingenuity of scholars, the exact dates have never been arrived at with certainty. Our authorities for His life are the New Testament writings; Jewish tradition and extra-canonical sources contribute hardly anything of value. A few of the non-canonical sayings may be authentic, but that is all. The apocryphal gospels are entirely untrustworthy. The life of Christ cannot be studied apart from New Testament criticism. It seems undoubted that we have in *Mark* a fairly primitive account of the life of Christ based partially on St. Peter's reminiscences, and that there are other independent sources, one particularly of Sayings of Jesus embedded in the First and Third Gospels. The historical value of the Fourth Gospel has been more questioned, but it is probable there are independent traditions enshrined in it.

The chronology of the life of Christ is complicated by the Gospel narrative covering the same ground, but with varied arrangement. Mark is chronological, but the other material arranged and combined by Matthew and Luke is often uncertain in chronology. To combine the Johannine with the Synoptic is very difficult. The life of Christ can scarcely even be summarized here, but some facts stand out. His first thirty years, or thereabouts, were passed in obscurity; His public work immediately followed that of John the Baptist; Jesus' work was not only healing and teaching, but had for its central point the proclamation of the imminence of the kingdom of God; His proclamation of Himself as Messiah was not made public at first, though after Peter's confession at Cæsarea Philippi made known to the disciples; the turning-point in the life of Christ was His setting forth on the journey to Jerusalem, conscious of His own death as the result; it is impossible not to see the impression of gloom and coming disaster in the later sayings and parables, which form one of the strongest proofs of the essential historicity of the Gospel narrative; the difference of tone in the narrative of the earlier and latest parts of the ministry could not be due to accident or intention; it is undeniable that the Crucifixion meant to the Apostles the crushing of all their hopes, and that, whatever explanation of the Resurrection accounts we accept, it cannot be denied that within a short time of the death of Jesus those who had known

Him on earth were convinced that they had seen Him alive.

For the teaching of Jesus on its practical side the Gospel evidence is clear and indisputable. Of its theological and personal side it is not so easy to speak with certainty. The phrase 'Kingdom of God' has been recently much discussed. Did it mean the slow growth of righteousness in the world or a violent catastrophe in which the old order would be swept away? Many scholars now assert that Jesus expected the immediate coming of the kingdom, and identified Himself with the Son of Man who in the later Judaism was expected to bring it in.

JET, compact black variety of lignite (brown coal), easily carved and polished, and so especially suitable for making mourning ornaments and trimmings. Whitby (Yorks) was once the seat of a flourishing industry; but the used of jet has been supplanted by that of vulcanite.

JETHRO, Old Testament character; *f.* of Zipporah, the *w.* of Moses.

JETSAM. See FLOTSAM AND JETSAM.

JETTISON, the act of throwing overboard part of a ship's cargo, either to lighten a vessel in a storm or to prevent capture by an enemy, or for any other justifiable cause. The master of a ship has the right to jettison his cargo in the extremity of danger. He is regulated by a maritime law.

JETTY, term used in engineering to designate structures thrown out (Fr. *jete*) from shore into river or sea for various purposes; wooden J's projected into harbors to facilitate loading and coaling, or to contract breadth of river in order to deepen channel; pile-work; largely used in Venice to narrow channel and prevent formation of sand-bar; used at narrow river-mouth where water tends to spread.

JEVER (53° 35′ N., 7° 54′ E.), town, Oldenburg, Germany. Pop. 6,100.

JEVONS, WILLIAM STANLEY (1835-82), Eng. philosopher and economist; assayer to Mint in Sydney, 1854-69; then studied at London Univ.; prof. at Owens College, Manchester, 1866, and at Univ. College, London, 1876; his life was cut short by drowning; eminent both in logic and economics; specially emphasized doctrine of utility and mathematical aspects of economics; his works: *Pure Logic, 1864*; *Theory of Political Economy, 1870*; *Principles of Science, 1874*.

JEW FISH, the name of two species of large fishes, found in American waters. One, known also as the black grouper, sometimes reaches a weight of 700 lbs. The other, which is found chiefly on the Californian coast, often weighs 500 lbs.

JEW, THE WANDERING.—According to the legend a Jew mocked Jesus, when bearing the cross, by saying, 'Go faster,' and Jesus replied, 'I go, but thou shalt wait till I return.' The origin of this legend is a pamphlet printed at Leiden, which states that the bp. of Schleseig had met a Jew, called Ahasuerus, at Hamburg, who claimed to be eternal and condemned to await Christ's return. The pamphlet spread over Europe, and for centuries claimants appeared under different names. Around the legend has grown a mass of lit., the subject being specially popular during the Romantic revival. The real source of the legend is probably *Matthew* 16[28], 'There be some of them that stand here which shall in no wise taste of death till they see the Son of Man coming in his kingdom.'

JEWEL, JOHN (1522-71), Eng. theologian; bp. of Salisburg, 1559; pub. *Apologia ecclesiæ Anglicanæ* against Rom. Church, 1562; engaged in controversy with Thomas Harding; at first of Prot. sympathies, but became anti-Puritan.

JEWELL, THEODORE FRELINGHUYSEN (1844), Rear-Admiral, United States Navy; 1864, graduated from United States Naval Academy; 1861, acting midshipman; 1863, commanded naval battery of field howitzers in defense of Washington; 1866, commissioned ensign; 1868, lieutenant; 1869, lieutenant-commander; 1885, commander; 1898, captain; 1904, rear-admiral; 1904, retired. Served on all foreign stations; 1890-1893, commanded Naval Torpedo Station; 1893-1896, superintendent of naval gun factory; commanded cruiser *Minneapolis* on scouting service in West Indies; commanded armored cruiser *Brooklyn*, serving in Philippine Islands. Member Naval Examining Board; 1904, commander-in-chief of European Squadron. Author of many articles and pamphlets on professional subjects.

JEWELRY, articles of personal adornment, often of great value owing to their being manufactured from precious metals and set with precious stones. Term includes such articles as swords, the scabbards or handles of which are set with gems; and caskets and insignia of various knightly orders. J. is not to be confused with gems (*q.v.*), which are engraved stones. Probably the first articles of J. were carved beads; native gold was used from an early date, and from the many examples of ancient J. it is evident that the ancients had a complete command over the metal, hammering it into very

thin plates or drawing it into very fine wires for plaiting or twisting. The metal was sometimes very beautifully chased and embossed. Rings found in their tombs show that the early Egyptians were skilful engravers, and could chase, solder, and enamel metals and also set precious stones. The ancient Greeks and Romans were highly artistic; the Etruscans were very fine metal-workers, and one of their lost arts is the giving of a granulated appearance to a golden surface. The Celts and Scandinavians were skilful engravers, and some results of their work is seen in the ancient brooches of Scotland and Ireland. Sometimes very fine examples of inlaying and filigree work are seen in these brooches.

The Hindoos have always been fond of rich J., and have produced much beautiful filigree work and enamelling. Ancient J. was produced entirely by craftsmen, but in modern times machinery is much used, especially in the manufacture of cheap J.

The J. trade is carried on in most of the large cities of the world, but especially at Paris, Vienna, and New York. Fine filigree work is done at Malta, and red coral J. comes from Naples.

JEWETT, SARAH ORNE (1849-1909), an American novelist and short story writer; *b.* in South Berwick, Me. After graduating from Berwick Academy, she began writing and became a steady contributor to the *Atlantic Monthly*, in which publication appeared most of her short stories, largely character sketches of New England. Among her writings are: *Deephaven, 1877*; *A Marsh Island, 1885*; *The King of Folly Island and Other People, 1888*; *Tales of New England, 1890*; *The Life of Nancy, 1895*; and *The Tory Lover, 1901*.

JEWISH WELFARE BOARD.—Organized in 1917, to provide social welfare for the soldiers, sailors, and marines in the service of the United States, and especially for men of the Jewish faith. Also to organize and assist in the activities of Jewish Centers, such as the Young Men's Hebrew Association, and the Young Women's Hebrew Association, and the like, and to develop good citizens and Judaism. The Welfare Board was amalgamated with the Young Men's Hebrew and Kindred Association on July 1, 1921. Affiliated organizations, 16; constituent societies, 370. During the World War the Jewish Welfare Board gave admirable service at home and abroad, and was notable for its generosity towards the non-Jewish races. From 1917 to 1920, it received $6,138,313, and disbursed $4,156,322. Assets in 1920, $1,981,990. President, Irving Lehman, New York City, 1923.

JEWS, a Semitic race descended from Abraham, through his *grandson*, Jacob, from whose sons the twelve tribes were traditionally descended. So called because the majority of those who returned to S. Palestine after the captivity in Babylon were of the tribe of Judah; also known as Israelites from the name given to Jacob, and as Hebrews, a name which may possibly be derived from a word meaning 'beyond.' Greater part of early history of race is covered by books of O.T. Abraham is said to have settled in Canaan about 2000 B.C., having migrated thither from his native place. 'Ur of the Chaldees,' on the W. bank of Euphrates; and after Jacob's return from Gilead he and his family settled at Shechem and afterwards at Beersheba.

They were subsequently driven by famine to migrate to Egypt, on the invitation of Joseph, Jacob's *s.*, who had become viceroy there. The children of Israel remained in Egypt for 215, or, according to some chronologists, 400 years. At first well treated, they were afterwards subjected to oppression and reduced to slavery, from which they were finally delivered by Moses, after the tenth plague had frightened Pharaoh into allowing them to go. After crossing the Red Sea they are said to have wandered in the wilderness forty years, during which time they received from God a code of social political, and religious laws, and at the end of which they successfully invaded the Promised Land, their ancestral home, under the leadership of Joshua, about 1270 B.C. The country to the W. of Jordan was apportioned to Asher, Benjamin, Dan, Ephraim, Issachar, Judah, Naphtali, Simeon, Zebulon, and the half-tribe of Manasseh; while that to the E. of the river was given to Gad, Reuben, and the other half-tribe of Manasseh. The Levites were given a number of towns in different parts of Canaan, and received also a tenth of the produce of of the soil. The period succeeding the death of Joshua is marked by disputes among the tribes, anarchy and infidelity, and by the attempts of surrounding nations to dispossess the Israelites of their country.

From time to time judges, or deliverers, arose, who shook off the foreign yoke; thus Ehud delivered the nation from Eglon, King of Moab; Gideon from Midianites; Jephthah from Ammonites; Samson from Philistines; while the seer Samuel prepared the people for the establishment of a monarchy.

Kings of Israel.—The first king was Saul, who conquered many surrounding peoples, but was defeated by the Philistines at Mt. Gilboa, when he killed himself. His successor, David, the greatest figure in the history of Israel and the

founder of a long line of kings, carried out a series of successful wars, and gave to the nation the full possession of the country from Euphrates to river of Egypt, as promised to Abraham, in *Gen.* 15:18. David was succeeded by his *s.*, Solomon, who was celebrated for his wisdom and vast wealth, and built the temple, although there were incorporated with the sacred cult heathern elements which many pious kings set themselves to eliminate. After his death the kingdom was rent in two: ten tribes revolted under Jeroboam, and formed the kingdom of Israel; while the other two, Judah and Benjamin, formed the kingdom of Judah under Rehoboam, Solomon's *s.* Among the nineteen kings of Israel, most of whom 'did evil in the sight of the Lord,' perhaps the most notorious were Jeroboam, *s.* of Nebat, 'which made Israel to sin' by establishing the worship of the golden calf; and Ahab, whose name is a synonym for cruelty. The last King of Israel, Hoshea, was conquered and imprisoned by Shalmanesser, King of Assyria, who also carried off the people into captivity, whence they never returned, their ultimate destiny being veiled in obscurity.

The history of Judah presents a less uniform spectacle of depravity than the N. kingdom; among the kings of David's line, although many were addicted to idolatry, there were several, such a Hezekiah and Josiah, who were enthusiastic in the cult of the national religion, and who also carried out numerous reforms. At its best, however, the prosperity of Judah was intermittent; and after a long struggle against Assyria, Egypt and the Chaldeans, which endured for over one hundred and thirty years, the S. kingdom was overtaken by the same fate as the N. Jerusalem was taken by Nebuchadnezzar in 588 B.C., and the nation was carried off to captivity in Babylon. Unlike the kingdom of Israel, however, Judah remained a separate people, retaining its own institutions in exile, and never becoming merged with the conquerors. Some account of the exile is given in the books of *Daniel*, *Ezekiel*, and other prophets; the exiles apparently settled down in comfort, if not content, and were treated with consideration.

Persian and Greek Domination.—In 539 B.C., they came under the rule of Persia, and three years later a number of them were allowed by Cyrus the Great to return; Jerusalem and the temple were rebuilt under direction of Ezra and Nehemiah, who also established a system of government in Palestine. Supreme administrative control was at first held by Zerubbabel, from whom it afterwards passed to others, and a council of elders was founded which inaugurated an epoch of great literary activity. Study of law was carried on by a special class of scholars, who exercised supreme control in spiritual matters, and are represented in later times by the Sanhedrin or great council of the Jews.

The period of Gr. domination begins with the break-up of the Persian Empire before the victorious forces of Alexander the Great, to whom Jerusalem surrendered, in 332 B.C. The Jews received many privileges from the conqueror, who invited many of them to settle in his new city of Alexandria. After his death, in 323 B.C., the country came into the hands of one of his generals, Laomedon, from whom it was subsequently taken by Ptolemy Soter; between 314 and 301 it was in possession of Antigonus of Syria, but reverted to the Ptolemies at the latter date. Under the Ptolemies the Jews enjoyed considerable prosperity' and were allowed to build synagogs in all their settlements. During several decades the possession of Palestine was contested by the Seleucids, and eventually the country was captured by Antiochus the Great, in 198 B.C. He also granted the Jews various privileges, as well as religious liberty; but his successors, Seleucus Philopator and Antiochus Epiphanes, subjected them to merciless persecution; the former pillaged the temple, the latter slew and enslaved many of the people and dedicated the temple to Jupiter.

His determination to eradicate Judaism and to hellenize the people resulted in a national rebellion, the standard of liberty being raised by Mattathias, a priest, and head of the Asmonæan family. Mattathias *d.* in 166 B.C., and his *s.*, *Judas Maccabæus*, after a series of magnificent victories, succeeded in expelling the Syrians and stablishing the *Maccabæan* or *Asmonæan dynasty*, under which the Jews attained a splendor resembling that of the time of David. On Judas' death his *brothers*, Jonathan and Simon, reigned in turn with wisdom and success. Simon was succeeded, in 135, by his *s.*, John Hyrcanus, who conquered Edom and Samaria, and supported the Sadducees, who, with the Pharisees, became an important sect during his reign. His *s.* and successor, Aristobulus I., was the first to assume the kingly title. About this time the power of the Asmonæans began to decline; civil wars disturbed the reign of Alexander Jannæus. 103-79 B.C., and after the death of his wife, Alexandra, who reigned 79-69, quarrels arose between their *sons* Hyrcanus and Aristobulus.

Roman Government.—This led to the intervention of the Romans, who, in 63, took Jerusalem and established their supremacy in Judæa. Hyrcanus II. was

nominated high priest by Pompeius, but he weakly allowed Antipater the Idumæan to take the control of affairs into his own hands; the result of this was that Antipater was, in 47, appointed procurator of Judæa by Julius Cæsar, and his *s.*, Herod the Great, became governor of Galilee. Herod was made King of Judæa, in 40 B.C., and three years later he seized Jerusalem and deposed Antigonus, the last prince of the Asmonæan family. After Herod's death, in 4 B.C., his kingdom was subdivided into a set of principalities: his *s.*, Archelaus, received Idumæa, Judæa, and Samaria; Herod Antipas became tetrarch of Galilee and Herod Philip tetrarch of the districts beyond Jordan. Soon afterwards Judæa and Samaria became provinces of Rome, and were ruled by Roman procurators; Pontius Pilate, during whose administration occurred the crucifixion of Jesus Christ, was procurator from A.D. 26-36.

After Pilate's death, the old kingdom of Palestine was temporarily restored under Herod Agrippa, who was allowed by Claudius to reign over the whole country; his reign was marked by persecution of Christians, but lasted only for three years. When he died, the country was again placed under administration of Roman governors, many of whom treated the Jews with great severity, with the result that insurrections were of frequent occurrence. Among the most merciless governors were Alexander, an apostate Jew, Felix, Albinus, and Gessius Florus. Under the last-named an open revolt broke out against Rome in Cæsrea, A.D. 66., and spread in all directions. The suppression of this rebellion was entrusted by Nero to Vespasian, who, on succeeding to the imperial throne, left the conduct of affairs in Judæa to his *s.*, Titus. Titus brought to a successful issue the siege of Jerusalem, planned by his *f.*; and the utter destruction of the city, in A.D. 70, finally deprived the Jews of their national habitat, their history thence forward being that of a people scattered all over the world. Great numbers fled to Egypt, Italy, Spain, Cyprus, and elsewhere. Those remaining in Palestine made one or two further attempts at insurrection, the last of which was led by Bar-Cochba and was put down by the Romans after a three years' war, 133-5. During this war great numbers of Jews were slain, and those remaining were forbidden to enter the new city of Ælia Capitolina, built by Hadrian on the site of Jerusalem.

The national religion, however, survived all catastrophes, and the Jews everywhere retained their own religious customs and traditions. Everywhere persecuted, they were yet everywhere successful; and it has been suggested that their material prosperity was the cause of the ill-treatment to which they were from time to time subjected by the nations among whom they lived. Little more than half a century after the suppression of Bar-Cochba's rebellion there were two regularly organized Jewish communities; of these one was under the Prince of the Captivity, to whom all Eastern Jews acknowledged allegiance, and the other was under the Patriarch of Tiberias, and included all the Jewish inhabitants of the Roman Empire. Compilations of oral laws were begun by scholars, and when complete were called the Talmud; the Palestinian Talmud was finished in IV. cent., the Babylonian Talmud in 500.

Emigration and Persecution. — Already in Roman times great numbers of Jews settled in Europe; they were generally subjected to severe persecution by the Christians, partly on account of their practice of usury, but continued to prosper, and by their genius for finance and commerce made themselves masters of international trade. In Arabia the rise of Mohammedanism resulted in the expulsion of the Jews of Homeritis; but in most Mohammedan countries they were, although heavily taxed, allowed to live in comparative comfort. In Spain, they attained their greatest prosperity, and lived on terms of close friendship with the Moors; many of them held offices of state, and letters and scholarship reached a high development; but they were banished from Spain, along with the Moors, late in the XV. cent. In Germany, in early and mediæval times they were mercilessly persecuted, reduced to a condition of slavery, and frequent massacres took place; from time to time they were expelled, and persecution continued even in the XVIII. cent.; in 1812, an Edict of Toleration removed many of their disabilities.

In France, they were at first regarded with toleration, but from the XI. cent. onwards they were decimated by a series of massacres, and in the XIV. cent. they were banished from the country; in 1791, their citizenship was established by the National Assembly, and, in 1805, a Jewish Sanhedrin was established. In England, they were regarded with favor by the first two Norman kings, but in the XII. cent. hostility to them broke out, and during the crusades they were subjected to cruel oppression. In 1290, they were banished, and for several centuries few were to be found in Britain; since the XVII. cent. they have been tolerated, and have received many concessions, so that they are now on terms of perfect equality with the rest of the population, the highest offices of state being open to them. Disraeli became prime minister;

while in 1920, the lord chief-justice was a Jew, as are also other high officials. In Russia and Rumania they met with great cruelty. In the U. S. they have had rights of citizenship since 1783.

About 1880, an anti-Semitic movement began in Europe among those nations whose jealousy was excited by the continually increasing wealth and influence of the Jewish inhabitants. In 1893, the idea of an autonomous Jewish state was revived by Theodor Herzl, the founder of the Zionist movement, which aimed at establishing such a state in Palestine.

In 1917, the Zionist movement received a great impetus with the Brit. capture of Jerusalem, and the declaration of the Brit. Government that every endeavor would be made to establish in Palestine a national home for the Jewish people. The Peace Conference gave Great Britain the mandate for the direction of affairs in Palestine, and in 1920 Sir Herbert Samuel was appointed high commissioner. He briefly outlined his policy as follows: the maintenance of complete religious liberty, the places sacred to the great religions remaining under the control of the adherents of those religions; civilian administration to be established, the higher ranks consisting of Brit. officials, the other ranks open to the local population, irrespective of creed; the economic development of the country to be undertaken; according to American Jewish Year Book 1923-4 there were in the world 15,500,000 Jews, of this number 20%, or 3,602,150 live in the United States, 67% in Europe. There were 83,794 Jews in Palestine.

JEW'S HARP, JEW'S TRUMP, small musical instrument in form of metal lyre held between teeth and played by plucking vibrating tongue.

JEZEBEL, the wife of Ahab, king of Israel; represented as a depraved woman and the enemy of Israel's God.

JEZREEL, a city of Canaan, situated on a spur of the Mt. Gilboa range, and 11 m. distant from Nazareth. It was the well-known capital of the Israelite monarch Ahab; here it was that Ahab coveted Naboth's vineyard, and here the Queen Jezebel had Naboth murdered. Both king and queen suffered a shameful death as foretold by Elijah in consequence of their sin. The modern village Zer'in, built of stone, stands on a bare and rocky knoll, where the remains of ancient cisterns and old sarcophagi are still seen.

JHABUA (22° 45′ N., 74° 38′ E.), town and native state, Central India. Pop. *c.* 82,000.

JHALAWAR (25° 7′ N., 77° 4′ E.), native state, Rajputana, India. Pop. *c.* 92,000. Capital, *Jhakrapatan* (24° 31′ N., 76° 8′ E.) is commercial center. Pop. 8,000.

JHANG.—(1) (31° 18′ N., 72° 25′ E.), district, Punjab, India. Pop. 380,000. (2) (31° 16′ N., 72° 23′ E.), town, capital of above. Pop. 25,000.

JHANSI.—(1) (25° 24′ N., 79° 10′ E.), district, United Provinces, India; area, with Lalitpur, *c.* 3,600 sq. miles; produces cereals, cotton; frequently suffers from famine. Pop. 618,000. (2) (25° 37′ N., 78° 35′ E.), walled town, capital of above; has fort. Pop., 1911, 55,724.

JHELUM, JEHLAM.—(1) (33° 12′ N., 72° 30′ E.), district, Punjab, Brit. India; area, 3,995 sq. miles; crossed by Salt Mountains and J. River. Pop., 1901, *c.* 595,000. (2) (32° 56′ N., 73° 41′ E.), town, capital of above. Pop. 15,500.

JHELUM, JEHLAM (34° N., 73° 27′ E.), river, India; unites with Chenab.

JHERING, RUDOLF VON (1818-92), Ger. jurist; prof. of Rom. Law. at Basel, Rostock, Kiel, Giessen, Vienna, and Göttingen successively; wrote *Geist des romischen Rechts auf den verschiedenen Stufen seiner Entwickelung,* famous work on Rom. law; also *Der Kampf ums Becht,* and other works.

JIB. See SAILS AND RIGGING.

JIBUTI (11° 36′ N., 43° 9′ E.), capital, Fr. Somaliland; fine harbor; exports coffee, rubber, ivory, live stock. Pop. 12,000.

JIDDA (21° 30′ N., 39° 22′ E.), port, Arabic, on Red Sea; important as chief port of Mecca, many thousand pilgrims landing here every year; extensive harbor; exports mother-of-pearl, coffee, carpets, balsams. Pop. variously estimated, 18,000 to 30,000.

JIG, dance of cheerful nature, common among peasants, especially popular in Ireland, where it has assumed a national character; generally written in 6-8 time ('jig-time').

JIGGER, CHIGOE, SAND-FLEA (*Sarcopsylla penetrans*), Amer. parasitic flea; female buries abdomen in skin, usually of human feet, and distends greatly with eggs; unless tampered with, the wound is harmless.

JIND (29° 17′ N., 76° 22′ E.), native state and town, Punjab, India. Pop. 280,000; of town, 9,000.

JINGO and **JINGOISM.**—The derivation of Jingo is uncertain, but in its modern application was borrowed from

the lines of a music-hall song by W. Hunt, very popular in 1878, the chorus of which ran—

'We don't want to fight, but by Jingo! if we do,
We've got the ships, we've got the men, and got the money too.'

The term J. was at that time used as a nickname for those who supported Beaconfield's anti-Russian policy of sending ships to the East to assist the Turks against the Russians. From this the term has come to mean any person who advocates a bellicose or *chauvinist* policy, and Jingoism, therefore denotes the policy of the Jingoes.

JINRIKISHA, a two-wheeled carriage or gig, drawn by a man, or men, running between the shafts, used universally in Japan, and extensively in China and other E. countries.

JIU-JITSU. See Ju-Jitsu.

JIZAKH (40° 12′ N., 1° 50′ E.), fortified town, W. Turkestan. Pop. 17,000.

JOAB, *s.* of Zeruiah and *nephew* of King David (*2 Samuel*).

JOACHIM I. (1484-1535), elector of Brandenburg, 1499; vigorous opponent of Reformation.

JOACHIM II. (1505-71) elector of Brandenburg; succ. his *f.* Joachim I., 1535; strengthened position in Brandenburg; in ecclesiastical questions took a *via media.*

JOACHIM, JOSEPH (1831-1907), violinist and composer; *b.* near Pressburg, Hungary; studied in Vienna and Leipzig; royal conductor of concerts, Hanover, 1853-56; *m.* famous contralto, Amalia Weiss; app. head of Berlin Hochschule, 1866; organized J. Quartet; foremost violinist of his day.

JOACHIM OF FLORIS (1145-1202), Ital. theologian and mystic; *b.* in Calabria; abbot of Corazzo, 1177, then founded abbey on Monte Nero; his theological view is that there are three stages of revelation, those of the Father, Son, and Holy Spirit—the last yet to come; his influence was considerable in heretical circles in France and Italy.

JOACHIMSTHAL (50° 23′ N., 12° 54′ E.), town, Bohemia, Austria; silver, nickel, uranium, lace, gloves; first *thalers* coined here, 1519. Pop. 8,000.

JOAN, POPE, a woman, who, pretending to be a man, became Pope John XII., 855; Döllinger proved the story a myth.

JOAN OF ARC (Fr. *Jeanne d'Arc*), (1412-31), the Maid of Orleans; *b.* in the vil. of Domrémy, near Vaucouleurs, on the borders of Champagne, on Jan. 6; of humble parentage. Her extraordinary character and conduct make her one of the most striking figures in history. From her earliest years, she was imbued with an ardent faith and love of religion, and her enthusiasm and habits of solitary meditation explain her visions and the angelic voices she professed to hear. She loved to be alone and brooded in her waking dreams over the legends of the saints, until they became to her real personalities. Gradually there came to grow up in her heart the conviction that she had been chosen by God to do a special work of deliverance for her country. She asserted she was commanded by a vision to conduct Charles VI., King of France, to Rheims, to be crowned, in 1429, and presented herself before the governor of Vaucouleurs. She was examined by the most intelligent men and counsellors, and at length was given permission to hasten to the deliverance of Orleans, D'Aulon being appointed her constant attendant and brother-in-arms. She donned male dress and a suit of white armor, and mounted on a black charger, put herself at the head of an army of 6,000 men, and advanced to aid Dunois in the siege of Orleans. She entered the city in April, 1429, and forced the English to raise the siege and retreat after fourteen days' fighting, and Charles entered Rheims and was crowned in July of the same year. Enemies soon multiplied around her, and she was at length captured by the Burgundians and sold to the English. She was imprisoned at Rouen, condemned as a heretic, and finally burned at the stake. She was canonized and placed on the role of saints, 1920.

JOANNA (1479-1555), queen of Castile, 1504; lost her reason; married Philip, *s.* of Maxmilian I.; their *s.* was Emperor Charles V.

JOANNA I. (1327-82); queen of Naples; married (1) Andrew of Hungary, (2) Louis of Taranto, (3) James of Majorca, (4) Otto of Brunswick.

JOANNA II. (1371-1435), queen of Naples; succ., 1414; reign marked by intrigues between queen, her ministers and lovers, and the rulers of Anjou and Aragon.

JOB, BOOK OF, belongs to the 'Wisdom Literature,' and deals with the problem of suffering, which, in the later stages of Old Testament theol., perplexed men. Formerly it was held that all suffering comes as punishment for sin, and it is against this J. was written. J. was a wealthy and prosperous, and also a pious man, and the Satan, whose func-

tion it is to try men, is allowed by God to see whether J.'s piety is merely the result of his prosperity. He does so, and J. is cast down by misery. J.'s friends try to persuade him that he has done wrong. J. is bewildered and sometimes defiant, and his friends do not really help him solve the problem. The solution is due to Elihu, who helps J. see the real meaning of his trial. Elihu's speeches, which some think a later addition, are meant to emphasize the discipline of suffering.

The text of J. is shorter in the LXX than the Hebrew. The date is uncertain. Formerly it was thought to be patriarchal, as J. leads a patriarchal life, and it was conjectured that he was Moses, as the book was then taken as literal history. But its whole tone and reflection on moral and spiritual problems indicate a much later date. These questions scarcely pressed for solution among the Israelites before the VI. cent. B.C. Its language, too, shows traces of Aramaic and Arabic influence which would not be possible earlier, so J. is probably V. cent.

JOB, HERBERT KEIGHTLEY (1864), Lecturer, Author; *b.* in Boston; Bachelor of Arts, Harvard, 1888; graduate of Hartford Theological Seminary, 1891; 1891-1898, Congregational Minister of North Middleboro, Massachusetts; 1898-1908, Kent, Connecticut. Member of faculty, Connecticut Agricultural College, and State ornithologist, 1908-1914; director of summer school and Ornithological Experiment Station since 1918, of National Association of Audubon Societies, Connecticut. Made expeditions to wilder parts of Canada and N.W. States. Nature photographer; has secured motion pictures and photographs of wild birds from life. Author of: *Among the Water Fowl, 1902*; *Wild Wings* (introduction by President Roosevelt), *1905*; *The Sport of Bird Study, 1908*; *How to Study Birds, 1910*; *Blue Goose Chase, 1911*; *The Propogation of Wild Birds, 1915*. Writes for magazines.

JODHPUR, MARWAR (26° 20′ N., 72° 30′ E.), native state, Rajputana, India; area, 34,963 sq. miles; watered by Luni and its affluents; produces salt (from Sambhar and other salt lakes), tin, iron, marble, cereals; joined Mutiny, 1857. Pop. 2,200,000. *Jodhpur* (26° 19′ N., 73° 2′ E.), the capital, a walled town, has a huge fortress in which are several ancient palaces. Pop. 62,000.

JOEL, BOOK OF, one of 'minor prophets.' The first part, to 2[17], contains a description of the approach of the 'day of Jehovah' heralded by portents, but there is still time for repentance. The latter part recounts God's mercy, and contains the famous passage, 'And it shall come to pass afterward that I will pour out my spirit upon all flesh, etc.'; the people are to prepare for war; the 'day of Jehovah' will come, Judah will prosper, but Edom will be a 'desolate wilderness.' The date of J. is disputed; formerly it was thought the reign of Joash was suitable, but now criticism inclines to the view that it is post-exilic. There are close parellels with the *Book of Amos*.

JOFFRE, JOSEPH JACQUES CÉSAIRE (1852), Marshal of France (title which had been in abeyance since 1871, revived for him in 1916); *b.* Rivesaltes, vil. of Pyrènèes-Orientales; *f.* a cooper; was educated at lycée of Perpignan; at seventeen entered the Polytechnique at Paris with good but not exceptional marks; served as lieutenant of engineers in war of 1870-1; promoted captain, in 1875, and remained in that rank fourteen years. In 1885, served in Indo-Chinese campaign, and became Courbet's right-hand man; organized the defences of Formosa and Tongking; was decorated, and in 1889, promoted major. In 1892, began construction of Fr. military road from the Senegal to the Niger. His name first became known to the public in 1894, when he occupied Timbuktu; promoted lieut.-colonel, and received the Legion of Honor. After serving as secretary to the Commission on Inventions he was sent to Madagascar, where he constructed the harbor and forts of Diego Suarez; promoted colonel. Returning to France, he became prof. at Ecole de Guerre; brigadier-general in command of the artillery, 1901; governor of Lille and general of division, 1905; commander of the Second army at Amiens and inspector of military schools, 1909. In 1911, he was appointed chief of General Staff, an appointment implying supreme command in time of war. Distinguished for his simplicity of character and life, alertness and clearness of mind, and organizing power; exhibits combination of intuition and reflection, and takes a wide outlook, without being obsessed by details; remarkable for sound common sense; known by his soldiers as 'Grand-père.' Was commander-in-chief of Fr. armies from outbreak of World War until December, 1916—*i.e.* through the black period of the war, which began with the terrible defeat of the French at Charleroi, and was followed by the long retreat to beyond the Marne. While France and Europe seemed to be in the direst peril, he was the one man who remained cool and unflurried, and he quietly organized the 'miracle of the *Marne*.' (See MARNE, BATTLE OF.)

On his retirement, in December, 1916, he was appointed the chief technical adviser to the Allied forces, and, in April, 1917, he was sent to America with Viviani and others on a special mission. He again visited the United States in 1922. He is a member of Fr. Academy, and has pub. *La Colonne Joffre* (Eng. trans., *My Journey to Timbuctoo*), and *Types de Casernes pour adopter en Madagascar*.

JOHANNESBURG (26° 12′ S., 28° E.), important commercial city and mining center of S. Africa, situated in Witwatersrand goldfield in Transvaal; founded in 1886, on discovery of gold, and rapidly grew in importance; during war J. taken by British, in 1900; city possesses many spacious streets and squares and handsome structures; among public buildings are stock exchange, law courts, Univ. Coll., clubs., theatres, and churches; has several large suburbs; other industries besides mining, are printing, milling, brewing, and founding. Pop. 250,000.

JOHANNISBERG (53° 37′ N., 21° 49′ E.), village and castle, Germany; produces Johannisberger wine.

JOHN, THE APOSTLE, *bro.* of James, and *s.* of Zebedee; traditional author of *Gospel of John, Epistles of John* and *Revelation* (*q.v.*); called 'disciple whom Jesus loved' (*John 13:23*); said to have lived at Ephesus, dying in extreme old age; another tradition makes him die earlier; sometimes identified with John the Presbyter (Elder).

JOHN, GOSPEL OF, the fourth of the Gospels, and a unique book. It has been almost more than any other book the battleground of criticism. It differs markedly from the first three 'Synoptists.' The discourses in it are quite unlike those in *Matthew* and *Luke*. Alone, it gives the turning of water into wine, and the raising of Lazarus. Scholars are still sharply divided as to whether it is from the hand of J., the *s.* of Zebedee. Its defenders argue it is the work of an eye-witness, a Jew, a Jew of Palestine, an apostle, the Apostle of St. J. Its assailants argue such a work could not be the work of one who had known Jesus, and that its style and theology are later. The question of evidence is exceedingly complicated, and here it can only be said that the external evidence is doubtful; the internal evidence is curiously conflicting, but on the whole, against the traditional authorship. Even its defenders allow that the thought of Christ's discourses is colored by the writer, while, on the other hand, it is generally admitted that J.'s date for the Crucifixion is right as against the Synoptists. It can hardly be earlier than 90 A.D., or much later than 110 (Schmiedel, 140, is too late), though it is uncertain it was used by Justin Martyr. It has been attributed to J. from Irenæus downwards. Some think it is the work of a presbyter J., confused with the apostle and *s.* of Zebedee. It seems impossible to deny the difficulties in accepting it entirely,or to deny not only its spiritual but hist. value. It can hardly be unconnected with the other Johannine writings, or, ultimately, with the apostle.

John, Epistles of, three in number. (*1*) *John* has been held to be by the author of the Gospel since Irenæus, and only a few critics deny it. The traditional authorship is supported by the Muratorian fragment on the Canon, Origen, Clement of Alexandria, and Tertullian. It probably dates from the first quarter of the II. cent. The heresy denounced is probably Docetism. *2* and *3 John* were sometimes reckoned among the 'doubtful' writings They appear in the Muratorian fragment, but the early Syriac Church did not recognize them. *2 John* is addressed to an 'elect lady,' and by this some Asian Church is probably signified. *3 John* is written to Gaius, and is probably closely connected with *2 John*. All three Epistles are of the same school, and are connected with the Gospel.

JOHN (*c.* 1167-1216) king of England; youngest *s.* of Henry II.; succ. 1199; murdered *nephew* Arthur, 1203. On his *m's* death he lost Anjou, Normandy, Maine, Touraine; quarrelled with pope over Langton's election as abp. of Canterbury, and was excommunicated; signed Magna Charta, 1215.

JOHN, name of twenty-three popes: *John XII.* (955-64) was deposed by Otho the Great, but drove out Leo VIII.; his successor. *John XXI.* (1276-77), probably same as 'Peter the Spaniard,' a learned medical writer. *John XXII.* (1249-1334), *b.* at Cahors, France; elected to papal chair on death of Clement V., 1316; supported Frederick of Austria in his struggle against Louis of Bavaria for the imperial throne; excommunicated Louis, who, in 1328, deposed him and secured the election of another pope, Nicholas V. J., however, regained the pontificate in 1330; wrote the decretals called *Extravagantes*, and pub. the *Constitutions of Clement V., 1317*. *John XXIII.* (*d.* 1419), antipope; original name, Baldassare Cossa; passed years before entering Church as corsair; was elected on death of antipope, Alexander V., 1410. Gregory XII. still reigned, and the antipope, Benedict XIII., John

XXIII. was deposed, 1415, by Council of Constance; was imprisoned for three years in Germany; app. bp. of Tusculum, 1419.

JOHN, DON, OF AUSTRIA (1546-78), illigetimate *s.* of Charles V.; defeated Moors in Granada, 1569-71; commanded fleet against Turks, on whom he inflicted severe defeat at Lepanto, 1571; occupied Tunis, 1573; governor of Netherlands, 1576; won battle of Gembloux, 1578; *d.* same year.

JOHN OF AUSTRIA (1629-79), Span. soldier; putative *s.* of Philip IV. of Spain; put down Neapolitan rising, 1647; Catalonian revolt, 1651-52; fell from favor for subsequent defeats, but ultimately obtained chief power after Philip's death.

JOHN (1296-1346), king of Bohemia; aided Louis of Bavaria against Frederick of Austria in struggle for imperial throne; put down several risings in Bohemia; annexed Silesia; twice invaded Italy; supported France against England; killed at Crécy; lost eyesight in 1340.

JOHN VI., or **V., CANTACUZENE,** Byzantine emperor, 1341-54; became joint-emperor, by revolution, with pupil, John Palæologus; feeble, extortionate ruler; forced to abdicate; wrote a history of his time.

JOHN II., THE GOOD (1319-64), king of France; defeated by Black Prince at Poitiers, 1356; taken prisoner to England.

JOHN II. (1397-1479), king of Aragon; *m.* Blanche of Navarre, and through her became lifelong possessor of the throne of Navarre.

JOHN III., SOBIESKI (1624-96), king of Poland; had share in driving Charles XII. from Poland; saved Poland from Cossacks and Tartars, and afterwards from the Turks; elected king in 1674, and in 1683, gained brilliant victory over Turks, who were besieging Vienna; freed Hungary from Turkish domination. His efforts to reform country were frustrated by nobles.

JOHN (1801-73), king of Saxony; put down revolt, 1848; succ., 1854; supported Austria against Prussia, 1866; subsequently joined North Ger. Confederation and took part in Franco-Ger. War. 1870-71.

JOHN I. (*d.* 1294), Duke of Brabant and Lorraine. By defeating Henry III. of Luxemburg, acquired duchy of Limburg, 1288.

JOHN, DUKE OF BURGUNDY (1371-1419), aided Hungarians against Turks; succ., 1404; carried on struggle for several years with Louis of Orleans, whose assassination he contrived in 1407; took little part in wars between France and England; reconciled to the Dauphin 1419; killed by followers of Dauphin.

JOHN (1468-1532), elector of Saxony, 1525; strong supporter of Luther.

JOHN ALBERT (1459-1501), king of Poland; succ., 1492; planned an invasion of Turkey; defeated by hospodar of Moldavia, 1496.

JOHN GEORGE I. (1585-1656), elector of Saxony; succ., 1611; allied himself with Sweden, 1631; defeated by Wallenstein; signed Peace of Prague, 1635; warred against Sweden; defeated, 1636. *John George II.* (1613-80), encouraged art. *John George III.* (1647-91), fought against France. *John George IV.* (1668-94), quarrelled with Emperor.

JOHN FREDERICK I., THE MAGNANIMOUS (1503-54), elector of Saxony; succ., 1532; promoted Lutheran religion; defeated duke of Saxony, 1546; captured by Charles V., 1547; temporarily deprived of electorate.

JOHN MAURICE OF NASSAU, THE BRAZILIAN (1604-79), Dutch gov.-gen. of Brazil, 1636; organized new colony and extended its frontiers; subsequently took part in European wars; made famous collection of pictures.

JOHN ZAPOLYA (1487-1540), king of Hungary; put down peasant rebellion, 1514; elected king of Hungary, 1526; claim disputed by Ferdinand, Ger. king, whom J. Z. eventually defeated.

JOHN OF RAVENNA.— (1) (*b. c.* 1347), Secretary to Petrarch, and an extensive traveller. (2) (fl. 1370), a prof. at Florence. (3) *Malpaghini* (*b. c.* 1356), also a prof. at Florence, and teacher of Poggio Bracciolini.

JOHN OF ASIA, OF EPHESUS (fl. 550), early Syriac historian; founded great number of religious houses; suffered persecution under Justin II.; author of *Ecclesiastical History* and other works.

JOHN (1513-71), margrave of Brandenburg, 1535; became Protestant, 1538.

JOHN OF GAUNT, see LANCASTER, JOHN OF GAUNT, DUKE OF.

JOHN THE BAPTIST, in New Testament *s.* of Zacharias and Elisabeth, and forerunner of Jesus; preached repentance and baptized in wilderness; imprisoned and slain by order of Herod, whom J. rebuked for marrying his *bro.* Philip's wife.

JOHN, ST., OF DAMASCUS (*d. c.* 754), Gk. Father and theologican; en-

tered Palestinian monastery; strong opponant of iconoclasm; wrote works which, though not in themselves remarkable, sum up Gk. theology; wrote original of hymn, *The Day of Resurrection*; his Christology tended towards Apollinarianism.

JOHN BULL, a collective name used to designate the English people. It was first used by Dean Swift.

JOHN DOE, a name formerly given to the fictitious lessee of the plaintiff in a mixed action; that of the fictitious defendant being Richard Doe.

JOHN O'GROAT'S HOUSE (58° 39′ N., 3° 3′ W.), traditional site of John Groot's octagonal house, Caithness, Scotland; synonymous with most northerly point of Scotland.

JOHN, SIR WILLIAM GOSCOMBE (1860), Brit. sculptor; R.A.; works include statue of King Edward VII. at Cape Town, memorial to Lord Salisbury in Westminster Abbey.

JOHNS HOPKINS UNIVERSITY, institution founded in 1876, at Baltimore, Md., by Johns Hopkins, who bequeathed it $3,500,000. Because of its educational facilities and the celebrity of its professors, it rose rapidly to the rank of one of the foremost institutions of learning in the United States. In 1902, a tract of 176 acres in the suburbs of Baltimore was presented to the University as a new site, and by the summer of 1916 all departments of the University had been transferred to this new location. The curriculum is very broad, embracing departments of science, physics, engineering, arts and letters, philosophy, and medicine. The university offers facilities for post-graduate courses, elective courses, and also encourages the study at the institution of students who may only be able to spend there a limited time. There are evening courses also in business economics and engineering, and summer schools have been conducted since 1911. There is a university press which issues mathematical, philological, historical, political, science, electrical, and other periodicals. A marked addition was made to its medical facilities when the school of hygiene and public health established by the Rockefeller Foundation was opened, in 1917. The medical school is generally recognized as the greatest of its kind in the United States, and perhaps, in the world. The grounds and buildings are valued at $3,360,000. There are 200,000 volumes in the library. A considerable number of fellowships and scholarships have been established for the encouragement of students. In 1923, the endowment of the institution was $11,000,000; the enrollment of students was 3,200, and there were 400 members of the faculty.

JOHN B. STETSON UNIVERSITY, a co-educational institution, founded in 1884, at De Land, Fla., under the auspices of the Baptist Church. It was at first known as De Land University, but changed to its present name in honor of John Batterson Stetson, who heavily endowed it. It has departments of music, law, art, liberal arts, civil, electrical, and mechanical engineering, and normal and business colleges. In 1921-22, it had a faculty of 40, and a student body of 543.

JOHNSON, ALLEN (1870), University professor; *b.* in Lowell, Massachusetts; 1892, Bacherlor of Arts, Amherst College; 1895, Master of Arts; 1895-1897, at University of Leipzig, Doctor of Philosophy; 1899, of Columbia; 1892-1894, instructed history in New Jersey School; 1898-1905, professor of history, Grinnell College; 1905-1910, professor of political science and history at Bowdoin College; since 1910, Larned professor of American history at Yale. Author of: *The Intendant Under Louis XIV, 1899*; *Stephen A. Douglas, 1908*; *Report on the Archives of Maine, 1910*; *Readings in American Constitutional History, 1912*; *Union and Democracy, 1915*; *Jefferson and his Colleagues, 1921*; 1918-1921 edited *Chronicles of America*.

JOHNSON, ALVIN SAUNDERS (1874), Economist; *b.* in Nebraska; Bachelor of Arts, 1897, University of Nebraska; Doctor of Philosophy, Columbia College, 1902; 1901-1902, reader in economics at Bryn Mawr College; 1902-1906, at Columbia as tutor; instructor and adjunct professor economics; 1906-1908, University of Nebraska; 1908, University of Texas, professor of economics; 1911-1912, at Leland Stanford, Jr., university professor of economics; 1916-1918, professor of political science at Stanford University. Member American Economic Association, Phi Beta Kappa, Authors' Club. Author of: *Rent in Modern Economic Theory, 1903*; *Introduction to Economics, 1909*; *The Professor and the Petticoat, 1914*; *John Stuyvesant, Ancestor, 1919*.

JOHNSON, ANDREW (1808-75), seventeenth President of the United States; *b.* Raleigh, North Carolina. He had no schooling and was barely able to read when at the age of ten he was apprenticed to a tailor. He improved his spare time assiduously in study and after he had married his wife taught him in the evenings to write and cipher. His entrance into politics began when he was chosen as alderman of Greenville, Tenn.,

in 1828, by a workingman's party. He became mayor of that town, in 1830; served in the Tennessee Lower House, 1835-39, and in the State Senate, 1841. He was elected as a Democrat to Congress, in 1843, and served ten years in that body. He was governor of Tennessee from 1853 to 1857, and in the latter year became a member of the United States Senate. He was an ardent Unionist, and from March, 1862, until 1864, served with great courage and efficiency as military governor of Tennessee. Although nominally still a Democrat, the Republican party chose him, in 1864, to run for Vice President on the Lincoln ticket. The assassination of Lincoln, in 1865, placed Johnson in the Presidential chair. A few weeks later, the Civil War came to an end, and Johnson was faced with the problem of the reconstruction of the States lately in rebellion. For this task he proved wholly unfitted. He was egostistic, stubborn and vindictive, although his personal integrity was undoubted and he had considerable intellectual ability. His unfortunate indulgence in liquor weakened his influence, which began to wane almost immediately after his assumption of the Presidency. He was constantly at odds with Congress, and the struggle between the executive and legislative branches of the government finally led to his impeachment. He escaped conviction on the impeachment charges by only one vote. Following the expiration of his term of office he was chosen to the United States Senate, in 1875 but *d.* before taking his seat.

The most important events of Johnson's administration were the passage of the Civil Rights Bill; the adoption of the Thirteenth, Fourteenth, and Fifteenth Amendments to the Constitution; the purchase of Alaska and the admission of Nebraska into the Union.

JOHNSON, BURGES (1877-), Publisher. Born in Vermont. Graduate of Amherst College, 1899. 1899 reporter New York Evening Post. From 1900-1919 editor and manager of different book concerns in New York. Since 1915 associate professor of English at Vassar College. Author of: Rhymes of Little Boys, 1905. Pleasant Tragedies of Childhood, 1905. Beastly Rhymes, 1906. Rhymes of Home, 1909. Yearbook of Humor, 1910. Bashful Ballads, 1911. Rhymes of Little Folk, 1915. A Private Code, 1915. The Well of English and the Bucket, 1917. The Bubble Books, 1919. Youngsters, 1921. Writes for magazines.

JOHNSON, BUSHROD RUST (1817-1880), a Confederate soldier, *b.* in Belmont County, Ohio. He graduated from the West Point Military Academy, in 1840, served through the Seminole and Mexican wars, then resigned, in 1847, to teach mathematics in a military academy connected with the Univeristy of Nashville, Tenn. On the outbreak of the Civil War he entered the Confederate Army with the rank of major-general, was present at Shiloh, and at the Battle of Chickamauga distinguished himself by sweeping the Federal right wing from the field. After the war he returned to Nashville University, where he taught engineering and natural philosophy.

JOHNSON CITY, a city of New York, in Broome Co. It was known until 1916 as Lestershire. It is on the Erie and the Delaware, Lackawanna and Western railroads, and on the Susquehanna river. Its industries include the manufacture of boots and shoes, furniture, cameras, etc. Pop. (1920), 8,587.

JOHNSON CITY, a city of Tennessee in Washington Co. It is on the Southern, the Carolina, Clinchfield and Ohio, and the East Tennessee and Western North Carolina railroads. It is beautifully situated in mountain scenery and is a favorite summer resort. Its industries include the manufacture of wood products, iron products, cigars, furniture, etc. It is the site of a Soldiers' Home and the East Tennessee State Normal School. Among the public buildings is a public library. Pop. (1920), 12,442.

JOHNSON, CLIFTON (1865-), Author. Illustrator. Born in Massachusetts. Educated in public schools, 1870-1888. Author of: The New England Country, 1892. The Country School, 1907. The Farmers Boy, 1907. What They Say in England, 1896. Among English Hedgerows, 1899. Along French Byways, 1900. The Isle of the Shamrock, 1901. New England and Its Neighbors, 1902. The Land of the Heather, 1903. Old-Time Schools and School-Books, 1904. American Highways and Byways, 1904-1915. The Picturesque Hudson, 1909. The Picturesque St. Lawrence, 1910. Battleground Adventures in the Civil War, 1915. New England, 1917. Highways and Byways of Florida, 1918. What to See in America, 1919. John Burrough's Talks, 1922.

JOHNSON, DAVID BANCROFT, (1856-), College President. Born in Tennessee. 1877, Bachelor of Arts, University of Tennessee, Master of Arts, 1880. 1905 Doctor of Laws, South Carolina College. 1879-1880 assistant professor of mathematics, Univeristy of Tennessee. 1880-1882 principal of school. 1883-1895 superintendent and organizer city schools, South Carolina. Since 1895

president of Winthrop College, the South Carolina College for Women which he organized. 1902 organized the Rural School Improvement Association and South Carolina Association of School Superintendents. President 1884-1888 State Teachers Association. President normal school department, National Educational Association, 1911. 1915-1916 president of National Educational Alliance.

JOHNSON, EASTMAN (1824-1906), an American painter, *b.* in Lowell, Me. He studied art at the Royal Academy, in Dusseldorf, Germany, after which he traveled and for a while resided at the Hague, Holland. During this period he produced a number of canvases showing the influence of the old Dutch masters, among these being The Savoyard and and The Card Players. Returning to the United States, in 1856, he made a long study of rustic life, especially in the negro districts of the South. Later he produced a number of pictures which were widely copied in lithographs and became very popular. Among them were Old Kentucky Home, and The Husking Bee. He also painted a great number of portraits of prominent people, among his sitters being Abraham Lincoln, Grover Cleveland, Benjamin Harrison and John D. Rockefeller.

JOHNSON, EMORY RICHARD (1864-), an American univeristy professor and public official, *b.* in Waupun, Wis. He graduated from the University of Wisconsin, in 1888, has been professor of transportation and commerce at the University of Pennsylvania, since 1896, and dean of the Wharton School of Finance and Commerce, since 1919. He was expert on transportation for the U. S. Industrial Commission, in 1899, expert on the valuation of railroad property, for the U. S. Census, during 1904-5, expert on traffic for the National Waterways Commission, in 1909, and in 1911 he was appointed by President Taft to report on the Panama Canal traffic, tolls and measurements of vessels. Among his many works are "History of Domestic and Foreign Commerce of the United States" (1915) and "Principles of Ocean Transportation" (1917).

JOHNSON, SIR GUY (1740-1788), an American Tory and military leader; *b.* in Ireland. He served in the French and Indian wars, and succeeded his *uncle*, Sir William Johnson, in 1774, as Superintendent of Indian Affairs. At the outbreak of the Revolution he fled to Canada, and co-operated with Joseph Brant in leading the Mohawk Indians against the Americans.

JOHNSON, HERBERT (1878-), Cartoonist. Born in Sutton, Nebraska. 1899-1901, Western Normal College, and State University of Nebraska. Special courses at Columbia. 1896 assistant cartoonist on Denver paper. Head of Art and engraving departments on Kansas paper, 1897-1899. In New York, 1903. Manager of Sunday Art department of Philadelphia paper, 1906-1909. 1908-1912 cartoonist. 1912-1915 cartoonist, art editor of magazine. Member of Society of Illustrators, Authors' League of America.

JOHNSON, HIRAM WARREN (1866-), a U. S. senator, *b.* in Sacramento, Cal. He studied one year in the University of California, then became a shorthand reporter, meanwhile studying law in his father's office. He began practicing in Sacramento, in 1888, removed to San Francisco, in 1902, and there rose into sudden prominence as a member of the staff of prosecuting attorneys in the boodling cases, the chief defendant in which was the notorious Abe Ruef, local political boss. When Francis J. Heney, chief prosecutor, was shot down in court, Mr. Johnson stepped into his place and secured the conviction of Ruef, in 1908. Mr. Johnson was elected governor of California for the term 1911-15, and for the term 1915-19, but before the expiration of the latter resigned. He was one of the founders of the Progressive Party, in 1912, and in that year was nominee for Vice-President of the U. S. on that ticket. He was U. S. Senator from California for the terms 1917-23 and 1923-29.

JOHNSON, IRVING PEAKE (1866-), Bishop. Born in Hudson, New York. Bachelor of Arts, 1887 of Union College of New York. 1894 graduated General Theological Seminary. Doctor of Laws, Denver University, Doctor of Divinity, Union College. Deacon and priest, 1891 of Protestant Episcopal Church. 1891-1894 pastor of St. Andrew's Church, Omaha, Nebraska. 1894-1901, St. Martin's Church, South Omaha, Rector 1901-1913 Gethsemane Church, Minneapolis, Minnesota. 1913-1916 professor of divinity school at Fairbault, Minnesota. Since 1917 bishop of Colorado. Editor of *The Witness*.

JOHNSON, JOSEPH FRENCH (1853-), an American university professor, *b.* in Hardwick, Mass. He graduated from Harvard University, in 1878, later studying political economy and history in Germany. He was engaged in journalism for a while, being first on the staff of the Springfield Republican, and later financial editor of the Chicago Tribune. Since 1901 he has been professor

of political economy at the School of Commerce, Accounts and Finance, in the University of the City of New York, and dean of that institution since 1903. He is the author of *Money and Currency* 1905; *Business and the Man* 1916, and he made the report on the Canadian Banking System for the National Monetary Commission.

JOHNSON, OWEN (MC MAHON) (1878-), an American author, *b.* in New York City. He graduated from Yale University with the class of 1900, later founding and being the first editor of the Lawrenceville Literary Magazine. He is the author of *Arrows of the Almighty* 1901; *The Eternal Boy* 1909; *Murder in Any Degree* 1913; *Virtuous Wives* 1917, and *The Wasted Generation* 1921.

JOHNSON, REVERDY (1796-1876), an American statesman; *b.* at Annapolis, Md. After admission to the bar, he practised in Baltimore. He was elected to the United States Senate, in 1845, and in 1849, resigned to become Attorney General in the cabinet of President Taylor. He was senator again from 1863 to 1868, and in 1868-9 was minister to England.

JOHNSON, ROBERT UNDERWOOD (1853-), an American editor and author, *b.* in Washington, D. C. He graduated from Earlham College (Ind.) in 1871, and shortly after went on the staff of the Century Magazine, succeeding Richard Watson Gilder as editor in 1909, which position he held until 1913. He was U. S. Ambassador to Italy during 1920-21, and represented the United States as an observer at the San Remo Conference of the Supreme Council of the League of Nations, in April, 1920. He is the author of *The Winter Hour, and Other Poems* 1891; *Poems of War and Peace* 1916 and *Collected Poems* 1919.

JOHNSON, ROSSITER (1840-), an American editor and writer, *b.* in Rochester, N. Y. He graduated from the University of Rochester, in 1863, was associate editor of the Rochester Democrat, for four years, then edited successively the American Cyclopedia, the Standard Dictionary, the Annual Cyclopedia, and the Cyclopedia of American Biography. He is the author of *Phaeton Rogers—a Novel of Boy Life* 1881; *A History of the War of Secession* 1888; *A Short History of the War Between the United States and Spain* 1899; *The Fight for the Republic* 1917; *Biography of Helen Kendrick Johnson* 1917, and many other books dealing with United States history.

JOHNSON, SAMUEL (1709-84), Eng. man of letters; *s.* of a Lichfield bookseller; ed. Lichfield, Stourbridge, and Pembroke Coll., Oxford; left Oxford (1731) without a degree. Till 1762 he had a severe struggle with destitution; after failing as a school-master, started journalism in connection with Cave's *Gentleman's Magazine*, on which he was parliamentary reporter. Published poem *London* (1738), and started (1747) work on a new *Dictionary of the English Language*; there followed *Vanity of Human Wishes*, *The Rambler* (1752), the novel *Rasselas* 1759), and the periodical essay paper *The Idler* (1758). In 1735 he had married a Birmingham widow, who died in 1752. In 1762 he was given a royal pension of L300 a year, and lived comfortably after that. In 1763 began his friendship with BOSWELL (*q. v.*), and soon after the Literary Club was founded, with Burke, Boswell, Hawkins, Goldsmith, Johnson, among its members. J. now began to travel both in Britain and on the Continent with newly made friends, Mr. and Mrs. Thrale. In 1773 he visited Scotland. The rest of his life was embittered by ill-health, and the death or defection of many of his friends. The only literary fruits of this period were the *Journey to the Hebrides* and the *Lives of the Poets* 1781. He was buried in Westminster Abbey.

His Work.—In criticism J. belongs to the 'correct' school; he deprecates Milton's freedom of prosody; he objects to the Romantic Movement, and is suspicious of Gray's poetry. Yet he is a great critic, in spite of his 'correctness.' *The Vanity of Human Wishes* is not great poetry; it is too correct, too scholarly. The novel *Rasselas* fails in character delineation; nominally it is a tale of Imlac, an Abyssinian prince; in reality it is a book of wisdom and literary criticism. His prose, 'Johnsonese,' is much Latinised, sometimes ponderous; it is balanced, but regular antithesis makes it rhetorical sometimes.

Boswell, *Life*; Raleigh, *Six Essays on J.* 1910.

JOHNSON, THOMAS LOFTIN (1854-1911), an American political reformer, *b.* in Georgetown, Ky. He began his career as a clerk in a street railway office, and during this period, of six years, invented a number of car devices, among these being the Johnson rail and a fare box. Later he became a street railway owner in Indianapolis, extending these interests to Cleveland, Detroit and Brooklyn. Having acquired considerable means, he sold out his active interests and went into politics, joining the Democratic Party, but being also an ardent Single Taxer. He was in Congress during 1891-5; in 1901 he was elected Mayor of Cleveland, and was re-elected in 1903, 1905

and 1907. During his terms in office he put into effect a number of radical reforms. His special reform was a three-cent street railway fare. He wrote "*My Story*" 1911.

JOHNSON, SIR WILLIAM (1715-74), Brit. soldier; *b.* in Ireland; emigrated to America, 1738; acquired great influence over Indians; appointed sole superintendent of Indian affairs, 1755; took part in the expedition against Canada, and compelled the surrender of Niagara, 1759.

JOHNSON, WILLIS FLETCHER (1857-), editor. Born in New York. Bachelor of Arts, 1879, New York University. Doctor of Literature, 1901, Dickinson College. 1876-1877 principal of public school. 1880-1887 on editorial staff, 1887-1894 day editor, 1894 editorial writer and since 1917 literary editor of a New York paper. Since 1914 contributing editor of a magazine. Since 1882 lecturer at schools and colleges. Author of: *A Century of Expansion*, 1903. *Four Centuries of the Panama Canal*, 1906. *Colonel Henry Ludington, a Memoir*, 1907. *America's Foreign Relations*, 1916. *America and the Great War for Humanity and Freedom*, 1917. *History of Cuba*, 1920. *Political and Government History of the State of New York.*

JOHNSTON, ALEXANDER KEITH (1804-71), Scot. geographer; pub. numerous atlases and geographical works.

JOHNSTON, ALBERT SIDNEY (1803-62), an American general, graduated at West Point. He rapidly rose to the command of the forces of Texas, and successfully banished the Indian marauders from the N. of that state. After serving in the Mexican war, he was appointed paymaster to the United States Army, 1849, and, in 1858, quelled the Mormon revolt without bloodshed. On the outbreak of Civil War, he joined the Confederates, but was mortally wounded at Shiloh, 1862. President Davis pronounced his loss irreparable.

JOHNSTON, ANNIE FELLOWS (1863), author. Born in Indiana. Educated in public schools and State University of Iowa, 1881-1882. Author of: *Big Brother*, 1893. *Joel—A Boy of Galilee*, 1895. *The Little Colonel*, 1895. *In League with Israel*, 1896. *Ole Mammy's Torment*, 1897. *Songs Ysame, poems (with her sister)*, 1897. *The Gate of the Giant Scissors*, 1898. *Two Little Knights of Kentucky*, 1899. *The Little Colonel's House Party*, 1900. *The Little Colonel's Holidays*, 1901. *The Little Colonel's Hero*, 1902. *Cicely*, 1902. *Asa Holmes or At the Crossroads*, 1902. *Flips Island of Providence.* 1903. *Little Colonel at Boarding School*, 1903. *Little Colonel in Arizona*, 1904. *The Jester's Sword*, 1909. *Georgina of the Rainbows.* 1916. *Story of the Red Cross*, 1918.

JOHNSTON, ARTHUR (1587-1641); Scot. physician; after studying at Aberdeen and at Padua, lived in Sedan with Andrew Melville (*q.v.*), and later practised med. at Paris; became rector of King's Coll., Aberdeen, 1637; author of translation of the Psalms into Latin verse, and of other Latin poems.

JOHNSTON, CHARLES (1867-); author. Born in Ireland. Educated at Dublin University. Indian civil service for few years and visiting many cities in India. 1903 became citizen of United States. 1918-1919 Captain in Military Intelligence Division of United States Army. Translator; *From the Upanishads, Archaic Sanskrit*, 1896; *Bhagavad Gita*, 1908. *What is Art*, 1898. *The System of Vedanta, from German of Professor Paul Deussen, Yoga Sutras of Patanjali.* Author of: *The Memory of Past Births*, 1900. *Kela Bai*, 1900. *Ireland, Historic and Picturesque. The Parables of the Kingdom*, 1909. *Why the World Laughs*, 1912. Writes on Oriental, historical and literary subjects.

JOHNSTON, GORDON (1874-), Army Officer. Born in Charlotte, North Carolina. Bachelor of Arts, 1896, Princeton College. 1903 honorary graduate of Infantry and Cavalry School. 1918 graduated from General Staff College, American Expeditionary Forces. 1898 private in Troop M, 1st United States Volunteer Cavalry. (Rough Riders). Second lieutenant, 1899, 43rd United States Infantry. 1901 second lieutenant cavalry, Major National Army, 1917, lieutenant Colonel 1918, Colonel 1918. Promoted through the grades in the Regular Army to lieutenant-colonel, 1920. Served with American Expeditionary Forces in France and on Mexican Border 1918, chief of staff 82nd Division. Chief of staff 7th Regular Army. 1921 selected by Major General Wood as member Wood-Forbes Mission to Philippine Isl., and assistant to governor general. Awarded Congressional Medal of Honor.

JOHNSTON, SIR HARRY HAMILTON (1858-), Eng. traveller, administrator, and writer; explored Port. Congo (1883); led Kilimanjara scientific expedition (1884); vice consul in Kamerun (1887); explored lakes Nyasa and Tanganyika (1889); commissioner in Uganda (1899-1901); author of *Life of Livingstone* 1891, *The Uganda Protectorate* 1902, *The Nile Guests* 1903, *The Negro in the New World* 1910. Novels, *The Gay Dombeys* 1919, and *Mrs. Warren's Daughter* 1920.

JOHNSTON, HOWARD AGNEW (1860), an American clergyman and theological writer, *b.* in Greene County, Ohio. He graduated from the Lane Theological Seminary, in Cincinnati, Ohio, in 1885, was immediately ordained a minister of the Presbyterian Church. During 1899-1905 he was pastor of the Madison Avenue Church, in New York City, after which he was for two years special representative of the Presbyterian Church to its missions in Asia. He is the author of *Moses and the Pentateuch* 1891; *Scientific Faith* 1904; *Victorious Manhood* 1909 and *Enlisting for Christ and the Church* 1919.

JOHNSTON, JOSEPH EGGLESTON (1897-1891), a Confederate soldier, *b.* in Cherry Grove, Va. He graduated from West Point Military Academy, in 1829, and served in the Black Hawk, Seminole and Mexican Wars. At the outbreak of the Civil War he joined the Confederate Army as major-general of Virginia volunteers, and as such fought at Bull Run and Fair Oaks. He succeeded Bragg after the latter had been defeated at Chickamauga and in reorganizing his army showed unusual administrative capacity. In 1865 he surrendered to Sherman. He served in Congress during 1876-8 and was U. S. Commissioner of Railroads during 1885-9. He wrote *A Narrative of Military Operations During the Late War* 1874.

JOHNSTON, MARY (1870), author. Born at Buchanan, Botetourt County, Virginia. Educated privately. Author of: *Prisoners of Hope* 1898. *To Have and to Hold*, 1900, which was made into a motion picture 1922. *Audrey* 1902. *Sir Mortimer* 1904. *The Goddess of Reason* 1907. *Lewis Rand* 1908. *The Long Roll*, 1911. *Cease Firing* 1912. *Hagar* 1913. *The Witch* 1914. *The Fortunes of Garin* 1915. *The Wanderers* 1917. *Pioneers of the Old South* 1918. *Foes* 1918. *Michael Forth* 1919. *Sweet Rocket* 1920.

JOHNSTON, ROBERT MATTESON (1867-1920), an Anglo-American historian and educator, *b.* in Paris, France.. graduated from Cambridge University, England, in 1889, and for a while was a barrister in London. In 1908 he became professor of history at Harvard University. He wrote *The Roman Theocracy and the Republic*; *The Napoleonic Empire in South Italy and the Rise of the Secret Societies* 1904; *The Holy Christian Church* 1912; *Bull Run* 1913, and *Arms and the Race* 1915.

JOHNSTONE (55° 51′ N., 4° 31′ W.), town, Renfrew, Scotland; cotton, flax, iron, machinery, shoe laces. Pop. 13,000.

JOHNSTOWN, a city of New York, in Fulton Co., of which it is the county seat. It is on the Florida, Johnstown and Gloversville railroads, and on Cayadatta Creek. Its chief industry is the manufacture of gloves and mittens. Pop. (1920), 10,908.

JOHNSTOWN, a city of Pennsylvania. It is on the Pennsylvania and the Baltimore and Ohio railroads, and on the Connemaugh River and Stony Creek. It is the center of an extensive coal region and is the site of the great Cambria iron and steel works. Its other industries include the manufacture of wire, tin plate, wall paper, paint, cement, leather goods, woolen goods. It is a large trade center for an extensive farming and manufacturing region. There are two hospitals and banks. The city was the scene of a terrible disaster on May 31, 1889, when, as a result of a break in the dam across the south fork of the Conemaugh River, 10 miles above the city, the entire valley was devastated and the city and its surrounding villages were practically swept away, with a loss of hundreds of lives. The city rapidly recovered from this disaster. Pop. (1920), 67,327.

JOHOR (*c.* 1° 46′ N. to 2° 39′ S., 103° 50′ to 105° E.), independent sultanate, southern extremity of Malay peninsula; area, including islands to S., 9000 sq. miles; surface low-lying; forested; produces timber, sago, pepper, gambier. Foreign policy controlled by Britain. Pop. *c.* 200,000. J. Bahru (1° 46′ N., 103° 56′ E.), chief town.

JOIGNY (47° 59′ N., 3° 24′ E.), town, Yonne, France; interesting churches. Pop. 5000.

JOINERY is a development of carpentry. The carpenter is chiefly concerned with the construction of solid and usually rather rough timber work, such as is used to give strength and solidity to buildings; whereas the joiner is employed in more complicated work where perfect fit and finish is important. Most of the joiner's work consists of planing and sawing, and preparing and finishing all varieties of joints; there is a wide range of side and angle joints. Mouldings are largely used to give relief to plain surfaces. Small mouldings, such as beadings, are generally directly worked on to the framing; large ones are mostly worked separately and screwed into position.

JOINT, in anatomy, the structure which unites two parts of the skeleton. J's may be immovable, or *synarthroses*, when the two bones are united by a prolongation of the periosteum between them, or by a plate of cartilage, both forms being exemplified in the skull; or

they may be movable, *amphiarthroses* and *diarthroses*. Of the former there are two varieties, in the simpler type the bones being joined by bundles of strong fibro-cartilage, as the j's between the vertebræ, while in the other, surfaces of cartilage on each bone are joined by strong fibro-cartilage in the centre of which is a small cavity lined with synovial membrane, as in the case of the j. of the *symphysis pubis*. Diarthroses are freely movable j's, the ends of the two bones involved having each a surface of cartilage, so that they move upon each other with as little friction as possible. The cavity between them is lined with synovial membrane secreting a synovial fluid which acts as a lubricant.

The bones are bound together outside the j. by strong fibrous ligaments. There are several varieties of this type, in the knee and the j. of the lower *maxilla*, there are pads of cartilage in the j. cavity, so that there is greater elasticity in the j. In hinge-j's, as, for example, the j's of the fingers and toes, there are elevations on the cartilage surface of one bone, which fit into corresponding depressions in the other, so that movement can only be effected in one direction. In ball-and-socket j's the end of one bone is cup-shaped, and into it the end of the other, which is spherical, fits, and is kept in place by a ligamentous capsule which surrounds the j.; this type of j. gives the widest range of movement, examples being the hip-j. and shoulder-j. In a rotary j. one projecting bone fits into a ring formed by the other, and is held in place by suitable ligaments, movement being permitted in a rotary direction, as, for example, the j. between the axis (second vertebræ) and the atlas (first vertebræ).

A j. may be affected by inflammation of the synovial membrane, or *synovitis*, in which the j. is hot, swollen, and painful—treated by absolute rest, elevation of the limb, and hot fomentations; adhesions may form and may require to be broken down under an anæsthetic. In *arthritis* the cartilage of the j. is involved as well as the synovial membrane, there is severe pain, fever, the j. is swollen, and the fluid in it soon becomes purulent.

JOINTS, used in engineering to prevent leakage of steam, air, or water; generally made of packing, *e. g.* asbestos or hemp; j's in gas or petrol engines made gas-tight with a washer of asbestos surrounded with a ring of copper; j's in wood made by 'grooving' or caulking with oakum. J's in building are made with mortar.

JOINTS (in geology), cracks in rocks which run along natural planes of division and render quarrying of large regular blocks of stone practicable. Although often irregular, in sandstones they are nearly always at right angles to the bedding of the stone. Horizontal beds of rock generally have vertical j's. They are probably due to several causes—strain imposed upon rocks by movements of earth's crust in contraction; drying of sedimentary rocks; cooling of igneous rocks, etc. The latter effect produces a regular columnar structure, as at the Giant's Causeway, Ireland.

JOINT STOCK COMPANIES. See COMPANIES, LIABILITY.

JOINTURE, in law, originally estate settled jointly on husband and wife, now estate belonging to wife alone.

JOINVILLE, FRANÇOIS FERDINAND PHILIPPE LOUIS MARIE, PRINCE DE (1818-1900), third *s.* of King Louis Philippe; distinguished soldier; exiled at Revolution, 1848, but returned to France and sat in National Assembly, 1871-76.

JOINVILLE, JEAN, SIRE DE (1224-1319), Fr. historian; entered service of Thibaut of Champagne; subsequently went on crusade with Louis IX. of France, 1248-54; after his return he lived a good deal at court, but refused to go on second crusade. Towards close of his life he wrote his *Histoire de St. Louis*, an important work describing the king's life and character, and giving an interesting account of the Crusades.

JÓKAI, MAURICE (1825-1904), a Hungarian novelist, *b.* at Rév-Komarom. He qualified as an advocate, but, encouraged by the praises of the Hungarian Academy about his play *Zsido fiu* (Jew Boy), he went to Pesth and embarked on a literary career. The publication of his romance *Hetkoznapok*, 1845, marked an epoch in Hungarian literature, and firmly established its author's reputation. He was appointed editor of the *Elet kepek*, and became the centre of the rising talent of his country. For his part in the Revolution of 1848-49, and his support of Kossuth, he was proscribed by the government, and his life was only saved by a stratagem of his wife, Rosa Laborfalvy, the tragic actress. Until 1863 he took no further part in politics, but published sixty romances and edited three periodicals. In 1863 he founded the government paper *Hon*, and entered parliament, becoming an ardent supporter of Koloman Tisza (1875-90). Among his romances, nearly all of which have been translated into English are: *The Golden Age of Transylvania*, and its sequel, *The Turks in Hungary*; *Timar's Two Worlds*, 1888, perhaps his masterpiece; *Eyes like the Sea*, which won the

Academy's prize in 1890; *Midst the Wild Carpathians*, 1894, with its sequel, *The Slaves of the Padishah*, 1903; *Pretty Michael*, 1897; *The Lion of Janina*, 1897; *A Christian, but a Roman*, 1900; *The Baur's Sons*, 1902; and *Tales from Jokai*, 1904.

JOKJAKARTA, JOKJOKARTA (7° 56′ S., 110° 30′ E.), residency, Java, Dutch East Indies; sugar, indigo; chief town, J., has large citadel. Pop. c. 900,000.

JOLIET, a city of Illinois, in Will Co., of which it is is the county seat. It is on the Atchison, Topeka and Santa Fe, the Rock Island and Pacific, and other railroads, and on both sides of the Des Plaines River, and on the Illinois and Michigan canal. The city is important industrially and has manufactures of steel wire, stoves, boilers, tin plate, horseshoes, etc. It is the seat of the State Prison. There are two hospitals, a public library and an orphans' home, and other institutions. Pop. (1920), 38,332.

JOLIET, LOUIS (1645-1700), a French Canadian explorer, *b.* at Quebec; commissioned 1672 to explore Mississippi, which he did together with the Fox, Wisconsin, and Illinois rivers.

JOLY DE LOTBINIÈRE, SIR HENRI GUSTAVE (1829-1908), Fr. Canadian statesman; lieut.-gov. of Brit. Columbia, 1900-6.

JOMINI, ANTOINE HENRI (1779-1869), general and military writer, of Swiss birth; served with French at Austerlitz and Jena; went over to Russ. army, 1813; wrote extensively on military subjects.

JONAH, Hebrew prophet, mentioned in 2 *Kings* 14[25] as *s.* of Amittai, under Jeroboam II. (VIII. cent. B. C.); traditional author of Book of *Jonah*, which probably dates from V. cent., and is allegorical rather than historical.

JONAH, RABBI (*c.* 990-1050), great Hebrew exegete and lexicographer; *b.* Cordova; revolutionized Biblical criticism by basing his arguments on linguistic evidence.

JONATHAN, name of Old Testament characters: (1) son of Saul and friend of David; (2) a Maccabean prince.

JONES, ANDRIEUS ARISTIEUS (1862-), a U. S. senator, *b.* near Union City, Tenn. He graduated from Valparaiso University (Ind.), in 1884, taught school for several years, meanwhile studying law, and began to practice in Las Vegas, N. M. He was mayor of Las Vegas during 1893-4; special U. S. district attorney, during 1894-8; was first assistant Secretary of the Interior, during 1913-16; and was elected to the U. S. Senate as a Democrat for the terms 1917-23 and 1923-29.

JONES, HENRY ARTHUR (1851-), Eng. dramatic author; made first definite success with *The Silver King* 1882, followed by *Saints and Sinners* 1884, *Judah* 1890, *The Crusaders* 1891, *The Lie* 1914, etc. Has also produced a long series of comedies, including *The Case of Rebellious Susan*, *Whitewashing Julia*, and *The Ogre*; and has pub. *Renascence of the English Drama* 1895.

JONES, HILARY POLLARD (1863-), an American naval officer, *b.* in Virginia. He graduated from the U. S. Naval Academy in 1884. He took part in the Spanish-American War and was promoted through the various grades, becoming rear-admiral in 1917 and vice-admiral in 1919. In 1921 he was appointed admiral of the Navy. In 1916-17 he was with the Naval War College and in 1917 commanded a squadron of the patrol force of the Atlantic fleet. He was naval director of overseas transportation in 1919 and was vice-admiral commanding the second battleship squadron from 1919 to 1921. In July, 1921, he was appointed commander-in-chief of the Atlantic fleet.

JONES, INIGO (1573-1652), Eng. architect; arranged scenery for Johnson's masques; surveyor-gen. of royal buildings; designed banqueting hall (now Chapel Royal), Windsor.

JONES, JACOB (1768-1850), an American naval officer; *b.* in Delaware. He served in the war against Tripoli, and was captured and held prisoner for 18 months. His best known exploit was the capture of the British frigate *Frolic*, by the *Wasp*, in 1812. For this he was given a gold medal by Congress.

JONES, JENKIN LLOYD (1843-1918), an American peace advocate, *b.* in Cardiganshire, Wales, Great Britain. He came to this country with his parents as an infant, served as a soldier in the Federal Army during the Civil War and graduated from the Meadville (Pa.), Theological Seminary, in 1870. For many years he was pastor of All Souls Church, Chicago, but he became widely known as a lecturer advocating international peace. Among his works are *Practical Piety*, 1890; *Bits of Wayside Gospel*, 1899; *Love and Loyalty*, 1907, and *On the Firing Line in the Battle of Sobriety*, 1910.

JONES, JOHN CARLETON (1856-), University Dean. Born in Sharpsburg, Kentucky, 1879, Westminster College, Bachelor of Arts, 1882 Master of Arts.

1891, Doctor of Philosophy. Studied at Johns Hopkins, University of Leipzig, University of Munich. 1880-1882, Westminster, professor of Latin. 1883-1887 assistant professor of Latin and Greek, 1888-1891 associate professor of Latin, since 1891 professor of Latin, 1900 Dean of College of Arts and Sciences. 1905-1906 acting president, acting president 1921-1922 University of Missouri. Wrote on philological and educational subjects.

JONES, JOHN PAUL (1747-1792), a Scottish-American seaman, *b.* in Arbigland, Scotland. He was the *s.* of parents in humble circumstances and at an early age went to sea. For a time he served as a seaman on a slaver, then settled in Virginia. During the Revolutionary War he offered his services to the Continental Congress and was given command of a vessel with 18 guns, in which he repeatedly raided the British coasts and destroyed a great deal of shipping. In 1779 he was given command of a small squadron of French ships, flying the American colors, with which he did considerable damage to British ships, taking many prizes. After the war he received a commission in the Russian service and had command of a fleet operating against the Turks. Later he settled in Paris where he died and was buried, his body being later recovered and brought to the United States with military honors and buried at Annapolis.

JONES, JOHN PERCIVAL (1830-1912), an American politician, *b.* in Herefordshire, England. He came to this country as an infant, his parents settling in Ohio. When gold was discovered in California he joined the rush and spent some years prospecting. For a time he was a sheriff of Tuolumne County, and from 1863 to 1867 he was a member of the state senate. Shortly afterwards he removed to Nevada, where he entered politics as a Republican and acquired a great deal of influence among the miners, being elected to the U. S. Senate in 1873, where he served continuously till 1897. During the Presidential campaign of that latter year he supported Bryan as a silverite, but in 1900 returned to the Republican Party.

JONES, RICHARD (1790-1855), Eng. prof. of Political Economy, and author of economic works.

JONES, WESLEY LIVSEY (1863-), a U. S. Senator, *b.* in Bethany, Ill. He graduated from Southern Illinois College, in 1886, removed to the Territory of Washington just before it was admitted into the Union as a state and began to practice law in 1890. He was a member of Congress during 1899-1909 and Republican Senator for the three terms included in the period 1909-27.

JONES, SIR WILLIAM (1746-94), Brit. Orientalist; *b.* in London. In 1873 he was appointed judge in Bengal, and during his stay in India studied Hindu law; works include *Digest of Hindu Law*, 1800, *Institutes of Manu*, 1794, a *Persian Grammar*, 1772, and *Moallakat* (a trans.), 1783.

JONESBORO, a city of Arkansas, in Craighead Co., of which it is the county seat. It is on the St. Louis and San Francisco, the St. Louis, Southwestern, and the Jonesboro, Lake City and Eastern railroads. The city has important manufacturers of flour, lumber, cottonseed oil, machinery, etc. It is also the center of an extensive agricultural region. There is a State Agricultural School, an Elks' Home, a Federal building and a hospital. Pop. (1920), 9,384.

JÖNKÖPING, (57° 47′ N., 14° 12′ E.), town, Sweden; manufactures matches, carpets, paper, arms. Pop., 28,000.

JONQUIL, the popular name for *Narcissus jonquilla*, a well-known and beautiful species of Amaryllidaceæ. Several of the flowers are borne on one stem; in color they are yellow and the corona is well developed.

JONSON, BEN (1573-1637), Eng. dramatist and poet; *b.* London; posthumous son of minister of Scottish extraction; ed. Westminster; for a short time followed his stepfather's trade of bricklaying, but abandoned it for the army; served in campaigns in the Netherlands; returned to London and married, 1591-92; the union was not happy, and J. survived his family; became actor-playwright, fraternizing and sometimes working in conjunction with Dekker, Porter, and others; was tried for killing a fellow-actor in a duel, pleaded benefit of clergy, escaped death, but suffered branding and confiscation of property, 1598.

His first play, *Every Man in his Humour*, was staged about 1596, and taken over by Shakespeare in 1598, and produced at the Globe Theatre—a bright play, abounding in variety of interest; its sequel, *Every Man out of his Humour* is flat when compared with the original. Then followed several comedies, including *Cynthia's Revels*, 1600, *The Poetaster*, 1601, in which his dramatic rivals were satirised, *Volpone*, 1605, *Epicene*, 1609, *The Alchemist*, 1601, *The Magnetic Lady*, 1633. *Sejanus*, 1603, and *Catilina*, 1611, are two rather dull tragedies. *The Alchemist* is his masterpiece; Sir Epicure Mammon is a gem of character portrayal,

the situations are good, the story absolutely coherent, the minor parts worked out accurately. After the production of this, J.'s work grew inferior in quality.

J. wrote about 40 masques, mostly written in collaboration with Inigo Jones; they are charmingly beautiful, and form some of his best work. His poems are many and varied, ranging from graceful lyrics to scurrilous epigrams; they are classical in form and phraseology, but are nevertheless independent in spirit. The elegies on his eldest son and daughter are characterised by tenderness and affection. Of his songs, 'Drink to me only with thine eyes' is still popular.

J.'s prose marks a step in advance of Jacobean floridity; it is compressed and expressive without ornateness; his *English Grammar, and Discoveries*, a collection of 171 short pieces, are extant.

His last years were made unhappy by poverty and disease; his tomb is in Westminster Abbey.

JOPLIN, a city of Missouri, in Jasper co. It is on the Missouri Pacific and other railroads. It is the center of an extensive lead and zinc mining district and is the chief commercial city of the southwestern part of Missouri. In addition to mining, its industries include smelting and the manufacture of white lead. Pop. (1920), 29,855.

JOPPA, See JAFFA.

JORDAN, sacred riv.; Palestine (32° N., 35° 35′ E.); headstream, Hasbany, rises on slopes of Mt. Hermon and unites with Banias and Leddan about 33° 14′ N.; river then flows in s. direction and enters Sea of Galilee at its N. extremity, emerging at other end and flowing still s. till it empties itself into Dead Sea; length, 100 m. In World War, Brit. aeroplanes dropped bombs on motor-boat sheds and troops at mouth of Jordan on Dec. 15, 1917, and the closing of the river passages in Sept. 1917 was a great factor in Allenby's successes against Turks. See PALESTINE.

JORDAN, CAWILLE (1771-1821), Fr. politician; urged moderate reform at Revolution; proscribed, 1797; led constitutional party at Restoration.

JORDAN, DAVID STARR (1851-), an American educator and writer, *b.* in Gainesville, N. Y. He graduated from Cornell University, in 1872, was professor of natural history at Lombard University the year following; principal of the Appleton (Wis.), Collegiate Institute, during 1873-4; teacher in the Indianapolis (Ind.), high schools, during 1874-5; professor of biology at Butler University, during 1875-9; professor of zoology at Indiana University, during 1879-85, then president until 1891. From that latter year until 1913 he was president of Leland Stanford Jr. University, chancellor three years after that, and since 1916 president emeritus. Prof. Jordan stands in the very foremost ranks of American educators and enjoys an international reputation. He has written many books on the natural sciences, politics, sociology and kindred subjects. Among these are: *A Manual of Vertebrate Animals of the Northern United States*, 1876; *Footnotes to Evolution*, 1898; *Imperial Democracy*, 1899; *The Philosophy of Hope*, 1902; *A Guide to the Study of Fishes*, 1905; *College and the Man*, 1907; *The Religion of a Sensible American*, 1909; *The Unseen Empire*, 1912; *Democracy and World Relations*, 1918; *Fossil Fishes of Southern California*, 1819, and *Genera of Fishes*, 1920.

JORDAN, DOROTHEA (1762-1816), Irish actress; played for thirty years in Drury Lane; mistress of Duke of Clarence (William IV.).

JORDAN, ELIZABETH (1867-), an American editor and author, *b.* in Milwaukee, Wis. She graduated from the Convent of Notre Dame, in Milwaukee, and was for ten years on the editorial staff of the New York World, assistant editor on the Sunday World for three years, and editor of Harper's Bazar from 1900 to 1913, continuing as literary advisor to Harpers' Bros., the publishing firm, until 1918. She has written many books, among them being: *Tales of the City Room*, 1898; *Many Kingdoms*, 1908; *The Wings of Youth*, 1917, and a number of plays, including *The Lady from Oklahoma*, (produced in 1911); and *The Girl in the Mirror*, 1919.

JORDANES, JORNANDES (fl. VI. cent.), writer on Gothic history; entered service of Gunthigis, a Gothic chieftain, but subsequently, embracing Christianity, became a monk; said to have been bp. of Kroton. His most notable work is *De Origine Actibusque Getarum*, a history of Goths down to fall of Ostrogothic kingdom in Italy; narrative mainly taken from a lost history by Cassiodorus. J. also wrote *De Breviatione chronicum*, generally known as the *Romana*, a history of world down to Justinian's time.

JORDANUS, JORDAN CATALANI (fl. 1321-30), Fr. Dominican missionary; worked in India; bp. of 'Columbum,' Kulam, Travancore, 1330; author of *Epistles* urging a papal fleet in Indian Ocean, and of *Mirabilia*, containing famous descriptions of manners, customs, climate, fauna, and flora of India.

JORIS, DAVID (1501-56), heretic; at outbreak of Reformation violently attacked Catholicism and became Anabaptist; viewed himself as revealer of new dispensation, calling himself Christus David; lived at Basel and wrote several works.

JORULLO, OR XORULLO, a volcano of Mexico which came into existence in Sept. 1759, when a great eruption occurred. Has an altitude of 4315 feet.

JOSEPH, in New Testament, husband of Mary and 'father' of our Lord; not mentioned during Ministry, so was probably dead.

JOSEPH, in Old Testament, *s.* of Jacob; sold by his *bro's* into Egypt; rose to power under Pharaoh.

JOSEPH, BARSABAS, follower of Jesus, deemed worthy of nomination as one of the Twelve Disciples in Judas's place.

JOSEPH, king of Naples, afterwards of Spain. See BONAPARTES.

JOSEPH I. (1705-11), Holy Roman emperor, *s.* of Leopold I.; *b.* in 1678. In 1687, he was crowned King of Hungary; in 1690, king of the Romans, succeeding his *f.* as emperor and ruler of the Hapsburg dominions, 1705, supported by England, Holland, and Savoy, he warred successfully against Louis XIV. (Spanish Succession War). The Allies were commanded by Prince Eugene and Marlborough. J. granted privileges to the Protestants.

JOSEPH II. (1741-90), Holy Rom. emperor; *b.* Vienna; Ger. king, 1764; emperor, 1765; shared authority in Austria with his mother, Maria Theresa, who retained supreme power; signed treaty for partition of Poland, 1772; opposed Frederick the Great; succ. to Austrian throne, 1780; established religious toleration; furthered education, abolished serfdom, subordinated Church to State; joined Russia against Turkey with little success.

JOSEPH, FATHER (1577-1638), Fr. ecclesiastic famous for his connection with Richelieu, whose secretary and confidant he became; tried to convert Huguenots.

JOSEPH OF ARIMATHÆA, in New Testament, comes after the Crucifixion and asks Pilate for the body of Jesus: called in *Mark* a 'wealthy councillor'; *Matthew,* a 'rich man'; *Luke,* 'councillor'; according to *John,* a 'secret disciple for fear of the Jews.,' He buried Jesus in his own new rock-tomb.

JOSEPH FERDINAND, ARCHDUKE (1872), Austrian general; belongs to Tuscan branch of late Austrian royal family. During World War he was in command of 4th Austrian army; lost fortress of Lutzk during Russian offensive (1916), Germans taking control of sector immediately afterwards by sending Ludendorff s.; was later in nominal command of Austrian armies operating against Rumanians and Russians, but real direction of affairs was in hands of Mackensen.

JOSEPHINE, MARIE ROSE (1763-1814), an empress of the French and first wife of Napoleon, *b.* at Trois Islets, Martinique, her father being captain of the port of Saint Pierre. Her maiden name was Tascher de la Pagerie, and she first married the Vicomte de Beauharnais, by whom she had a son Eugéne, viceroy of Italy, and a daughter Hortense afterwards Queen of Holland and mother of the Emperor Napoleon III. Beauharnais was guillotined during the Reign of Terror (1794), and two years later his widow married Napoleon Bonaparte. She exercised a great influence over the emperor, and at Luxembourg and the Tuileries attracted around her the most brilliant society of France, but the union proving unfruitful, the marriage was dissolved in 1809, and the following year Napoleon married Maria Louisa of Austria.

JOSEPHUS, FLAVIUS (*c.* 37-97 A. D.), celebrated Jewish historian; became a Pharisee; was leader in Jewish rebellion in Galilee, but on his capture was spared by Vespasian, and subsequently marched with Titus against Jerusalem; author of *Jewish Antiquities* and *The Jewish War,* both dealing with history of the Jews.

JOSETSU (XIV. cent.), Jap. artist; left his mark chiefly as teacher, being the master of Sokokuji Shiubun, Sesshiu, and Kano Masanobu, founders of three distinct types of Jap. art.

JOSHEKAN (33° 16′ N.; 51° 14′ E.), province, Persia. Pop. *c.* 5000.

JOSHUA, the *s.* of Nun, succeeded Moses as leader of the Israelites and completed invasion of Canaan; subdivided the conquered land among the tribes of Israel. A bold and intrepid leader.

JOSHUA, BOOK OF, separated in Jewish canon from the *Torah* (Law), or Pentateuch, but really by structure and origin to be grouped with them to form the Hexateuch. Chaps. 1-12 describe the crossing of the Jordan and the conquest of Canaan by the Israelites, and

chaps. 13-24 the division of the land among the tribes. *Joshua* is composed from the same sources as the Pentateuch; it is probable that J and E (two narratives of about the IX. cent. B. C.), were combined into one first, then these were combined with other material by a Deuteronomic editor, and the whole united into the Priestly Code. The latter part of *Joshua* is rather fragmentary, and in the earlier forms of the narrative the conquest seems to have been much more gradual and by no means so thorough as it was afterwards supposed to have been; the partition among the tribes is represented as it was later.

JOSHUA THE STYLITE (V. cent.), traditional author of Syrian chronicle of importance for history of Eastern Empire.

JOSIAH, *s.* of Amon, king of Judah (639-609 B. C.); during his reign Jeremiah preached, and a religious reformation took place.

JOSIKA, BARON MIKLOS (1796-1865), Hungarian writer of romances, mostly historical.

JOTUNHEIM, JOTUN FJELDE (61° 30′ N., 8° 20′ E.), mountainous district, S. Norway; traditional home of Norse giants (*Jotuns*).

JOUBERT, BARTHELEMY CATHERINE (1769-99), one of youngest, most promising generals in Napoleon's army in Austrian invasion, 1798-99; commander of Ital. army, 1799; slain at *Novi*.

JOUBERT, JOSEPH (1754-1824), Fr. *litterateur*; most brilliant figure in salon of Madame de Beaumont, author of *Pensees*, maxims on ethics, theol., lit., and politics.

JOUBERT, PETRUS JACOBUS (1834-1900), Transvaal commandant-general; defeated British at *Laing's Nek*, *Ingogo*, *Majuba Hill* (1881); *d.* during last South African War.

JOUFFROY, THÉODORE SIMON (1796-1842), Fr. philosopher; assistant prof. in Paris, 1817; devoted himself to lecturing and literary work; became follower of Scot. philosophers; prof. at Collège de France, 1833; emphasised distinction between physiology and psychology; a learned populariser of ideas rather than an original philosopher.

JOUGS, chain with iron collar attached, used in Scotland, XVI.-XVIII. cent's, as pillory.

JOULE. The unit of work used in electricity. It represents the work done in one second by one ampere flowing through a resistance of one ohm. It is equal to 10,000,000 ergs, and approximately equal to 0.74 foot pound. It was named after its originator, James Prescott Joule, F. R. S., a famous English physicist born in 1818. In 1837 he published a description of an electromagnetic engine, and in 1847 he propounded the doctrine of the conservation of energy. He also carried out a great deal of research into the mechanical equivalent of heat. He died at the age of seventy-one in 1889.

JOULE, JAMES PRESCOTT (1818-89), Eng. physicist; *b.* Salford; pupil of Dalton; formulated law of production of heat by passage of electric current in a conductor. By a long series of laborious experiments, determined mechanical equivalent of heat, *i. e.* the number of work units required for a given rise of temperature.

JOURDAN, JEAN BAPTIST, COUNT (1762-1833), Fr. soldier; defeated Austrians at *Wattignies*, 1793; at *Fleurus* 1794; commanded in Rhine campaign 1795; defeated at *Amberg* and *Wurzberg* 1796; *Stockach*, 1799; marshal of France 1804.

JOURNALISM, business or profession of gathering news and presenting it in readable form and with appropriate comment in public periodicals, especially newspapers. It is a comparatively modern vocation, and has grown rapidly with the spread of popular education and the multiplying of mechanical appliances. The newspapers of a century ago were limited in scope, embarrassed for lack of capital, deficient in personnel, and the news, brought by stage coach or sailing vessel, was weeks or months old before it was printed. Today the telegraph has brought the ends of the earth together, and an event happening in any continent can be fully and accurately described in the next day's newspaper.

The evolution of journalism in America has been gradual and has developed with the growth of the country. In the early days of the republic, great caution had to be exercised in dealing with public events or criticising Government officials. Certain restrictions were placed upon the newspapers under the administration of President John Adams; but there was such an overwhelming sentiment throughout the country in favor of the freedom of the press that these restrictions were soon abolished. Since that time the American newspaper has been untrammeled in its statements and criticisms, subject only to the laws against libel and those governing public decency.

The middle and the latter part of the XIV century was the epoch of "personal" journalism, so-called, in which the opinion of certain brilliant editors were more important to the readers of the paper than the news which it contained. Men like Horace Greeley, Henry J. Raymond, Thurlow Weed and Henry Watterson exerted an influence far greater than any editor of the present day. Later the personal element was absorbed and lost in the general contents and policy of the paper, and today it would puzzle many an intelligent man to name offhand the editor of his favorite paper. Coincident with this eclipse of the personal element has been a lessening of political bitterness and a greater breadth of tolerance and opinion in newspaper policy. The great papers are no longer the organs of a special party which they support through thick and thin, but hold themselves quite free to criticise the policy or personalities of their own party as vigorously as those of the opposition.

The great modern newspaper is a vast organization usually with a large capital, an army of reporters, editors, special writers and correspondents.

Its mechanical plant is equipped with enormous presses capable of turning out hundreds of thousands of copies an hour. Many have elaborate pictorial supplements. The substitution of mechanical for hand typesetting and the use of wood pulp for paper have cheapened the cost of publication and correspondingly increased the circulation. With the growth in circulation has come an immense volume of advertising, upon which the paper depends as its main source of revenue. Consideration for the interests of advertisers and the desire to extend the circulation in competition with other papers has necessarily, human nature being as it is, had its influence on the ethics of the profession. There is a temptation to exploit spicy bits of scandal and this has given rise to so-called "yellow" journalism. In the main however, the ethical standard is fairly high. Confidences given by public men are seldom betrayed, and many instances exist of a refusal to suppress news at the insistence of important advertisers. The leading papers try to maintain a strict line of demarcation between the business and editorial departments of the organization. It is safe to say that journalism has never been on a higher plane than it is today.

Journalism, though the newspaper is its special province, is not confined wholly to this field. There are vast numbers of agricultural, class, trade and religious publications which are naturally modified in character and limited in scope because of the special audiences that they address.

JOVE, See JUPITER.

JOVIANUS, FLAVIUS (332-64), Rom. emperor, succeeding Julian, 362; reversed pagan policy of Julian.

JOVIUS, PAULUS, PAOLO GIOVIO (1483-1552), Ital. historian; *b.* Como; studied med. at Padua and Pavia, but renounced the profession in favor of lit.; Leo X. advanced him, and he became attached to the family of the Medici; great work was a history of his own times.

JOWETT, BENJAMIN (1817-93), Anglican scholar and divine; ed. Balliol Coll., Oxford; became tutor of his coll.; prof. of Greek, 1855; Master of Balliol, 1870; suspected for his liberal views in theology; had enormous influence in Oxford; best known as a scholar for his translations of Plato, Aristotle, and Thucydides.

JOWETT, JOHN HENRY (1864-), Brit. Congregational minister; educated at Edinburgh and Oxford Universities; was successively minister in Newcastle and Birmingham, afterwards (1911) accepting a call to Fifth Avenue Presb. Church, New York; since 1918 has been minister of Westminster Chapel. He was president of Free Church Council (1910), and is a D. D. of Edinburgh and New York; possessed a remarkable gift of oratory, and pub. *Apostolic Optimism, Silver Lining, The Preacher: his Life and Work; Things that Matter Most*, etc.

JUAN DE FUCA, STRAIT OF, a narrow strait between Vancouver Island and the state of Washington, on the W. coast of the United States.

JOYEUSE (44° 29′ N., 4° 15′ E.), small town, Ardèche, France; gave name to noble family whose ducal title passed to Guise family in XVII. cent.

JUAN FERNANDEZ ISLANDS (33° 42′ S., 78° 45′ W.), volcanic islands (belonging to Chile), S. Pacific; largest is Mas-a-Tierra, where Alexander Selkirk (prototype of Robinson Crusoe) lived 1704-9; few inhabitants.

JUAN MANUEL (1282-1349), Infante of Castile; served in many military campaigns, specially in Moorish wars; known even better as author; though active in other ways, wrote much; among his writings are—*Cronica abre, viada, Libro de la caza, Cronica de Espana, Cronica complida*; learned in classical and Oriental lore.

JUANGS, primitive Indian race, living in forests of Orissa.

JUAREZ, BENITO PABLO (1806-72), a Mexican statesman, born at San Pueblo Guelatao, Oajaca, of Indian parentage. Called to the bar in 1834 and made a judge of the civil court in 1842, he became governor of the state of Oajaca in 1847, which post he filled till 1852 greatly improving the provincial conditions during that time. He was exiled from Mexico in 1853, but returned two years later and joined Alvarez and the revolutionists. In 1857 he was made chief justice and secretary of the interior, and was finally elected president in 1858 in succession to Comonfort. He retained this position till his death, and his vigorous and liberal policy was of great benefit to the nation.

JUBA, Jub (0° 30′ S., 42° 30′ E.), river, E. Africa; headwaters, Ganale, Webi, Dawa, rise in S. Abyssinia, unite near Dolo; river then flows S., separating Ital. Somaliland from Brit. E. Africa, and enters Ind. Ocean below Gobwen.

JUBA I., king of Numidia, 61-46 B. C., who assisted Pompey and slew himself after *Thapsus.* His *s. Juba* II., received his f.'s kingdom from Augustus (30 B.C.), but surrendered it in return for Mauritania (25 B. C.); he wrote works of scholarship, now lost.

JUBBULPORE, Jabalpur (23° 9′ N., 79° 58′ E.), town, Central Provinces, India; manufactures cotton, carpets. Pop. (1911), 160,651. J., district, has area *c.* 3920 sq. miles. Pop. 685,000. J., division, has area *c.* 18,600 sq. miles. Pop. *c.* 2,090,000.

JUBILEE YEAR, celebration in R. C. Church every 25th year, when faithful are granted indulgence if they visit specified churches; 'extraordinary' jubilees on special occasions are also held.

JUBILEE, YEAR OF, the 50th year, which, it is commanded in *Leviticus* 25, should always be observed by not gathering then the harvest—even of wild fruits or plants; nor was there to be sowing or reaping; property which had been alienated was to be restored; these regulations were not observed.

JUBILEES, BOOK OF, Old Testament apocryphal book, written about II. cent. B. C., to defend Judaic nationalism against encroachments of Hellenic civilization. The Jewish law had existed in heaven from eternity; its author, a Pharisee, believed in gradual coming of Messianic age; book is preserved in an Ethiopic version, and fragments in Gk., Latin, and (possibly) Syriac; Latin and Ethiopic were made from Gk., original language probably Hebrew.

JUCAR (39° 10′ N., 0° 13′ W.), river, E. Spain; flows to Mediterranean.

JUDÆA, term applied to S. Palestine in time of Christ.

JUDAH (31° 30′ N., 35° 15′ E.), district of ancient Palestine, between Philistia and Dead Sea; belonged to tribe of Judah in Old Testament times; tributary to Egypt, 608 B. C.; conquered by Babylon, 587 B. C.; by Greece, *c.* 333 B. C.; by Rome, *c.* 63 B. C. See Jews.

JUDAH, according to the Genesis narrative, was the fourth *s.* of Jacob and Leah, *b.* at Haran in Mesopotamia. The tribe which bears his name was the most important of the twelve, and from it sprang the house of David. It is now generally believed, indeed, that its prominence is Israelitish history is due almost entirely to this king, to whom is attributed the union of clans, signified, according to the ethnic interpretation now so popular, by the incident of J. and Tamar.

JUDAS ISCARIOT was chosen as one of Apostles by Christ (meaning of *Iscariot* uncertain, perhaps *man of Kerioth*); given thirty pieces of silver for betraying Christ. According to *Matthew* 27[5], Judas repented and hanged himself; according to *Acts* 1[18], he burst asunder; his place in the Twelve was filled by Matthias.

JUDAS, not Iscariot (John xiv. 22), spoken of in the Lucan list as either 'brother' or 'son of James.' He is generally identified with the Thaddeus of Matthew and Mark.

JUDAS TREE (*Cercis*), genus of tree of order Leguminosæ; *C. siliquastrium,* S. European tree with rose-colored flowers, is, in legend, the tree on which Judas hanged himself.

JUDD, SYLVESTER (1813-1853), an American novelist and theologian, *b.* in West Hampton, Mass. His novels *Margaret* and *Richard Edney* were remarkably popular. He also wrote several poems and published several volumes of sermons.

JUDE, Epistle written in the name of Jude, *bro.* of James, *bro.*, therefore, also of Christ; whether actually written by him is doubtful, for its attestation is not particularly strong. It was accepted by 200 A. D., witness the Muratorian fragment on the Canon. Origen, Tertullian and Clement of Alexandria quote it. It presents close literary parallels with *2 Peter,* and the probability is that *Peter* is dependent on Jude, though some scholars invert the relation. Jude quotes the apocryphal Book of *Enoch.*

JUDGE, an officer of the law whose chief functions are deciding on points of law, and passing of sentence. See JUDICIARY, AMERICAN.

JUDGE-ADVOCATE-GENERAL. The head of the United States Army Bureau of Military Justice, with the rank of brigadier-general. He acts as legal advisor to the Secretary of War and the War Department and is custodian of records of trials and examinations of military courts and of papers relating to lands under control of the War Department, excepting the grounds and public buildings in the District of Columbia. The European nations have all officials who fulfill the same functions.

JUDGES, BOOK OF, so named from the 'Judges' who ruled over Israel. 1^{1}-2^{5} contains an account of the land itself; 2^{6}-16 gives in detail the history of the thirteen judges. Reckoned consecutively with the intervals between them, the total period of the judges would be 410 years. But, as this is far too long, it is probable that several may have been contemporary, and the author has pieced the separate stories into one continuous narrative. Chapters 17-21 contain a sort of appendix. The book shows traces of the incorporation of older materials. The 'Song of Deborah' is among the most ancient parts of Old Testament lit.

JUDGMENT, a decision and determination in law of a court in an action. The Judgment may be either final or interlocutory. If interlocutory, it is given on only some special point preceding, and it does not complete the action. A final Judgment can only be altered by an appeal to a higher court.

JUDGMENT, THE LAST. Christian eschatology deals in a particularly clear manner with a final resurrection, and the doctrine of the resurrection of the body finds a place in the creed of the Christian Church. This is closely connected with the article of the L. J. The Nicene Creed says that Christ 'shall come again with glory to judge both the living and the dead.' This belief is founded upon: (1) Many parables of Christ recorded in the Gospels, such as those of the wedding-feast of the king's son, the ten virgins, the talents, and the sheep and goats. (2) Other statements of our Lord, such as that contained in John v. 28, 29. (3) The clear words of St. Paul (2 Cor. v. 10), 'we must all appear before the judgment-seat of Christ; that every one may receive the things done in his body, according to that which he hath done, whether it be good or bad.' (4) The account given in the apocalypse of St. John (Rev. xx. 12 ff.). Briefly, the general Christian idea of the L. J. is that when the end of the world comes, those who have died before that time, will rise again with their own bodies, though these will be spiritualised as was Christ's body after His Resurrection. Then all, both living and dead, will be judged by Christ. The judgment is not to be considered as arbitrary but as perfectly just and in accord with Christ's work as Saviour—'out of thine own mouth will I judge thee.'

JUDICIARY, AMERICAN. The federal judiciary system, as established the Constitution, is composed of the Supreme Court, which functions as the highest tribunal, and lesser courts whose distribution and operation are determined by Congress. The Supreme Court has nine members, including a Chief Justice, who receives $15,000 a year; the others, known as associate judges, receive $14,500. The tribunals inferior to this august body, which reviews their decisions when appealable, are the Circuit Courts of Appeal, the Circuit Courts, and the District Courts. The jurisdiction of the federal courts is very sweeping and is laid down by the Constitution. There are also other federal judicial bodies, namely the Court of Claims, which provides a channel for suits against the government, the Court of Customs Appeal, whose title explains its functions, and the courts of the District of Columbia.

For the purpose of dispensing justice under the federal constitution, the United States and its territories are divided into nine judicial circuits or districts, each of which has a Circuit Court, with subdivisions in which sit numerous District Courts, the lowest federal tribunals. The Circuit Court of Appeals, established in 1911 to relieve the Supreme Courts of many cases that would otherwise congest the calendar, is composed of one Supreme Court justice assigned to each Circuit Court and a bench of Circuit and District judges of each judiciary district. The Circuit Courts, which formerly exercised the appelate jurisdiction now vested in the Circuit Courts of Appeal, have three or more judges, who receive $8,500 a year, and hear cases appealed from the District Courts. The latter courts exceeded one hundred in 1923. Each is presided over by a District Judge, who receives $7,500 a year. In each federal judicial district is also a United States Attorney, who prosecutes violations of federal statutes, and each has a United States marshal who carries out the will of the Court. All federal judges are appointed by the President with the approval of the Senate.

The nine districts in which the Federal, Circuit and District Courts function are

called Judicial Circuits and are as follows: *First Judicial Circuit*, Maine, Massachusetts, Rhode Island and Porto Rico; *Second*, Connecticut, New York, Vermont; *Third*, Delaware, New Jersey, Pennsylvania; *Fourth*, Maryland, North Carolina, South Carolina, Virginia, West Virginia; *Fifth*, Alabama, Florida, Georgia, Louisiana, Mississippi, Texas, Canal Zone; *Sixth*, Kentucky, Michigan, Ohio Tennessee; *Seventh*, Illinois, Indiana, Wisconsin; *Eighth*, Arkansas, Colorado, Iowa, Kansas, Minnesota, Missouri, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Utah, Wyoming; *Ninth*, Arizona, California, Idaho, Montana, Nevada, Oregon, Washington, Alaska, Hawaii.

The States have a similar judiciary system, but there is no definable uniformity in the procedure and practice of their various courts, and the different names the courts bear also confuse the uninitiated as to their jurisdiction. Generally, there is a supreme court or court of appeals, a superior court, county and municipal courts and magistrates or justices of the peace. The highest tribunal (supreme court or court of appeals) functions in State litigation as the U. S. Supreme Court does in federal suits. In some States the higher court, in addition to exercising final judgment, has original jurisdiction, as in Massachusetts, where the Supreme Court can hear actions at their start before one of its justices, appeal being taken from his judgment to the full court. In several States there are tribunals called supreme courts that are not supreme, there being courts of last resort above them. New York has such a Supreme Court, composed of 107 judges (1923), who, like the federal Circuit judges, are divided into groups and form courts that sit in designated judicial districts. Each justice can hold court in any county within his assigned district. Judges of the N. Y. Supreme Court, as named by the Governor, also constitute four courts of appeal, called the appelate divisions, whose decisions may be taken to the final Court of Appeals. Below the so-called supreme courts come so-called superior courts (in some states differently named) which hear appeals from lower courts in a group of counties over which they have jurisdiction. The county courts, which also have varied names, exercise civil and criminal jurisdiction (in some States they function also as surrogate's courts in probating wills) and hear appeals from decisions of justices of the peace. These latter preside over petty or primary courts for passing upon minor offenses or commit cases for a grand jury's action. In the large cities the functions of justice of the peace have developed into many courts with an extensive municipal magistracy usually appointed by the mayor. Most of the State judges are chosen by popular vote.

JUDITH, the heroine of the Book of Judith, in the Apocrypha. She was a widow of Manasses, and according to the story, went to the tent of Holofernes, the commander of the Assyrian army which was besieging Bethulia. Having secured admission to his tent, and charmed him with her beauty, while he slept she cut off his head with her own sword and returned to her own camp.

JUDITH, BOOK OF (Apocrypha); religious romance; relates saving of Jerusalem by Judith, who kills Holofernes, general of Nebuchadnezzar; hardly historical; its date may be Maccabæan, or more probably c. 50 B. C., as it somewhat resembles *Psalms of Solomon*.

JUDSON, ADONIRAM (1788-1850), Amer. Congregationalist minister; missionary to Burma, 1812; became Baptist; translated Bible into Burmese; one of earliest and most important of Amer. missionaries.

JUDSON, HARRY PRATT (1849), an American university president, *b.* in Jamestown, N. Y. He graduated from Williams College, in 1870, taught school a number of years in Troy, N. Y., was professor of history at the University of Minnesota, during 1885-92; professor of political science there, during 1892-4; and since 1907 he has been president of the University of Chicago. He is the author of *Caesar's Army*, 1885; *Europe in the Nineteenth Century*, 1894; *The Higher Education as a Training for Business*, 1896, and *The Government of Illinois*, 1900.

JUDSON, EDWARD (1844-1914), an American Baptist clergyman, *b.* in Burma, India. He came to this country as a small child and graduated from Brown University, in 1865. He gained prominence in New York City because of his advocacy of the wider jurisdiction of the church which, he contended, should consider the social welfare of the people as well as their spiritual good. He instituted a church dispensary, fresh air funds for children, etc., in connection with the Judson Memorial Church, which he erected in memory of his father, Adoniram Judson. He was the author of *The Institutional Church*.

JUEL, JENS (1631-1700), Dan. diplomatist; ambassador to Sweden, 1660-68, 1672, 1674, 1697; approved of Griffenfeldt's policy of alliances to isolate Sweden; established ostensible friendship with Sweden.

JUEL, NIELS (1629-97), Dan. admiral; commander of first rank; by victories over Sweden temporarily relieved humiliating position of Denmark; won battle of *Kjoge*, 1677, against enormous odds.

JÜERTBOG, Güterbog (51° 59′ N., 13° 2′ E.), town. Brandenburg, Prussia. Pop. 8,200.

JUGGERNAUT, town in Bengal, famous for annual rites, when idols of Hindu gods are drawn outside the city; formerly accompanied by immorality and human sacrifice.

JUGO-SLAVIA, or **KINGDOM OF THE SERBS, CROATS AND SLOVENES,** kingdom of S.E. Europe (40° 45′-46° 45′ N., 16°-23° E.), bounded N. by Austria and Hungary, N.E. by Rumania, E. by Bulgaria, S. by Greece, W. by Albania, Adriatic Sea, and Fiume buffer state, but W. frontier is not yet delimited. On W. are Dinaric Alps; remainder mostly Rhodope massif; between these are several fertile but isolated basins (*poljen*) —*e.g.*, Kossovo, Uskub, Monastir. Principal rivers are Drave, Save, Danube (with Bosna, Drina, and Morava tribs.) in N., Vardar to Ægean Sea, and Narenta to Adriatic. Apart from Karst lands, surface has forests and grazing areas; livestock are raised and exported to Italy, etc.; agriculture is widely practised, and grain grown for export as well as for home consumption; fruit crops are important; there are few industries. Kingdom suffers from lack of seaports, but access to Fiume and Salonica is guaranteed, and commercial outlets may be developed on Adriatic, to which, however, access is difficult. Railways (*c.* 1,000 m.) run from Belgrade (cap.) to Salonica; from Zagreb (Agram) to Hungary, Fiume, and Ragusa. Politically Jugo-Slavia includes the pre-war kingdoms of Serbia and Montenegro and the Austro-Hungarian districts of Croatia-Slavonia, Bosnia-Herzegovina, and parts of Carniola, Styria, Dalmatia, and Banat. Under the secret Treaty (or Pact) of London (1915)—which was, however, known to the Slavs —Italy was granted E. Adriatic ports from Pola to Valona; these are claimed by Jugo-Slavs on nationalistic basis (Pact of Corfu, July 1917). See Italy. In Dec. 1918 the Slavs of Serbia, Montenegro, and the Austro-Hungarian dists. specified above announced to the powers the creation of the new kingdom under the Karageorgevitch dynasty. The present ruler is Alexander I. Area, 86,880 sq. m. Pop. *c.* 11,600,000. See map of Czechoslovakia.

JUGULAR VEINS, THE. Their number varies in different individuals, but the four chief ones are: (*a*) the *external jugular*, which can usually be seen through the skin and muscle on the side of the neck. It runs in a line drawn from the angle of the jaw and eventually pierces the deep fascia above the middle of the clavicle and joins the *subclavian*. It receives its blood from the scalp and deeper parts of the face. (*b*) *Anterior jugular*, smaller, runs about half an inch from middle line of the neck. (*c*) *Posterior jugular*, collecting from the neck. (*d*) *Internal jugular*, uniting at the root of the neck with the subclavian to form the *vena innominata*; its blood is obtained from the superficial parts of the face and the deeper parts of the cranium. 'Cutting the throat' usually results in injuries to one or more of these veins. A severance of the *internal* is critical, and in the case of division of any of the jugular veins death may follow from the admission of air to the cardiac cavities.

JUGURTHA (II. cent. B. C.), king of Numidia; served in Numantia, 134 B. C.; co-ruler of Numidia with his cousins, Hiempsal and Adherbal, 118; assassinated former, defeated and killed latter, 112; waged war with success against Romans, 110; subsequently defeated by Quintus Metellus; finally captured by Marius and put to death at Rome, *c.* 104.

JUJU, W. African generic term for any kind of charm; a witch-doctor may 'lay' j. on a man or object; the man probably dies. The object is considered sacred, hence j. in certain cases resembles taboo.

JU-JITSU, or Jiu-Jitsu, is defined by Nitobe in *Bushido: the Soul of Japan*, as 'an application of anatomical knowledge to the purpose of offence and defence. It does not depend upon muscular strength, but consists in clutching or striking such part of an enemy's body as will make him numb and incapable of resistance.' Incapacity, not insensibility, is its object.

JUJUBE (*Zizyphus*), shrubs of order Rhamnaceæ; fruit of *Z. vulgaris*, when dried, is a sweetmeat. J. sweets, made of sugar and gum-arabic, have no connection with plant.

JUJUY (23° 30′ S., 66° 30′ W.), province, N. W. Argentina, S. America; mountainous; produces salt, gold, silver-lead, copper, petroleum, cereals. Pop. (1910), *c.* 62,400. Chief town, Jujuy, has pop. *c.* 6,000.

JULEP, a drink which is usually a solution of sugar and aromatic water. In the United States the name is given also to an alcoholic drink consisting of gin, brandy or whiskey, sugar and a seasoning of mint. This is called Mint Julep.

JULIA, the name of several Roman women of rank, belonging to the Julia Gens: (1) *Sister* of Julius Cæsar, the *wife* of M. Atius Balbus, and the *grandmother* of Augustus. (2) (*d.* 54 B.C.) *Daughter* of Julius Cæsar by Cornelia. She married Pompey in 59. (3) (39 B.C.-14 A.D.) *Daughter* of Augustus by Scribonia. In 25, she married her *cousin,* M. Marcellus, who *d.* two years later. She then married M. Agrippa, by whom she had five children, Caius and Lucius Cæsar, Agrippa Postumus, Julia, and Agrippina. Her third marriage, in 12 B.C., was to Tiberius Nero, who was afterwards emperor. In 2 B.C. Augustus banished her to Pandataria, an island of Campania, on account of her adulteries, and she was subsequently removed to Rhegium, where she *d.* (4) (*d.* 28 A.D.) *Daughter* of the above, and *wife* of L. Æmilius Paulus. Like her *mother,* she was notoriously immoral, and was banished by Augustus to Tremerus, an island off Apulia, in 9 A.D. (5) The youngest *daughter* of Germanicus and Agrippina, murdered by Claudius at the instigation of Messalina. (6) (*d.* 59 A.D.) *Daughter* of Drusus and Livia, *sister* of Germanicus, also killed by Claudius at Messalina's instigation.

JULIAN (331-63), 'The Apostate,' Rom. emperor; *s.* of Julius Constantius and nephew of Constantine the Great; obtained title of Cæsar and governship of Gaul, 355; gained great victory over Alemanni, 357, and reduced Frankish tribes to submission; became emperor in 361, and proclaimed toleration of all religions, while personally preferring paganism to Christianity. In 363 he prepared to invade Persia; and, having led a powerful army through Mesopotamia and Assyria, crossed the Tigris and prepared to besiege Ctesiphon, but abandoned project, and marched inland to meet Shapur II.; was surrounded by Persian army, and mortally wounded. He was remarkable as last champion of paganism.

JULIAN CALENDAR, see Calendar.

JÜLICH, Juliers (50° 55′ N., 6° 21′ E.), town, Rhenish Prussia, Germany; formerly fortified; manufactures sugar. Pop. (1919), 6,620. Was capital of former Duchy of Jülich, created 1356, succession to which was question of great political importance in XVII.-XVIII. cent's; annexed by France, 1801; acquired by Prussia, 1814.

JULIEN, STANISLAS (*c.* 1797-1873), Fr. Chinese scholar; great gift of tongues; librarian at Fr. Institut (1827); Conservateur of Royal Library (1839); administrator of the Collège de France (1859); wrote on Taoism and Buddhism, and trans. many important Chin. works.

JULIUS I., pope; elected to papal chair, 337; supported Athanasius in Arian dispute.—**JULIUS II.** (1443-1513) became pope, 1503; banished Cesare Borgia from Italy, and recovered Romagna; arranged league of Cambrai with Maximilian I. and Louis XII. against Venice, 1508; subsequently concluded Holy League against France, 1511; opened 5th Lateran council; encouraged the fine arts and lit.—**JULIUS III.** (1487-1555), pope, 1550; favored Jesuits; founded Collegium Germanicum.

JULIUS CÆSAR. See Caesar, Caius Julius.

JULLUNDUR, Jalandhar (31° 19′ N., 75° 28′ E.), town, Punjab, India. Pop. 69,000. District has area *c.* 1,330 sq. miles. Pop. 920,000.

JULY, 7th month of year; *Quintilis* (5th month) in Rom. calendar; named after Julius Cæsar, who fixed days at 31.

JUMIÈGES (49° 27′ N., 0° 49′ E.), town, Seine-Inférieure, France; ruined Benedictine abbey.

JUMILLA (38° 27′ N., 1° 18′ W.), town, E. Spain. Pop. 16,700.

JUMNA, Jamuna (25° 20′ N., 81° 57′ E.), river, N. India; rises in W. Himalayas, flows S. through Silawik Hills to form boundary between Punjab and United Provinces, and unites with Ganges near Allahabad.

JUMPING.—(1) high jump; competitor must clear bar and land on his feet for fair leap; each allowed three attempts; (2) long jump from mark; ground is broken to allow easy descent; competitors must not overstep mark, and must attain balance on alighting.

JUNAGARH, Junagadh (21° 29′ N., 70° 22′ E.), town, Bombay, India. Pop. 34,500. Junagarh, feudatory state, has pop. 397,000.

JUNCTION CITY, a city of Kansas in Geary Co., 70 miles west of Topeka. It is the center of an important agricultural community and its industries include the manufacture of boots and shoes, gloves, etc. Fort Riley, a military post of the United States army is in the neighborhood. Pop. (1920), 7,533.

JUNE, 6th month of year; 4th in Rom. calendar, where it had 26 days; Julius Cæsar added 4 days.

JUNEAU (58° 20′ N., 134° 25′ W.), town, Alaska, N. America; formerly

called HARRISBURG; gold mines. Pop. (1920), 3,058.

JUNGFRAU (46° 32′ N., 7° 58′ E.), mountain, Bernese Oberland, Switzerland (13,669 ft.); J. means the 'maiden.'

JUNGLE (Sanskrit *Jangala*, desert), the name applied to tracts of land which are thickly covered with trees or shrubs, made nearly impassable by tall grasses and undergrowth. The soil is, as a rule, marshy, and these J's are inhabited by beasts of prey, snakes, and monkeys.

JUNGLE FEVER, a disease prevalent in eastern countries and other tropical regions. It is a variety of remitting fever and is characterized by paroxysms, fever and ague.

JUNGLE FOWL, the name of two groups of birds, one found in Australia, and the other in India, Java, etc. The Indian fowl is abundant in the higher wooded districts. The Jungle Fowl is the size of an ordinary domestic fowl. Its colors are rich and beautiful.

JUNIATA, a borough of Pennsylvania in Blair Co. It is on the Pennsylvania railroad. Its industries include silk mills and railroad repair shops. Pop. (1920), 7,660.

JUNIATA RIVER, is formed near Huntington, Pa., near the center of the state, by the Little Juniata and the Frankstown Branch, flows easterly 150 miles and enters the Susquehanna at Duncannon, 14 miles above Harrisburg. It is noted for the picturesque scenery along its banks.

JUNIN (10° 53′ S., 75° 28′ W.), central department, Peru, S. America. Pop. *c.* 305,000.

JUNIPER, coniferous shrubs possessing needle-shaped leaves in the majority of cases (e. g. *Juniperus communis*). J. *Sabina* has closely scaly leaves, like the cypress, but exhibits the simpler type in the seedling. The so-called 'berry' is due to the cone scales becoming fleshy on ripening. The berries are used for flavoring gin, which derives its name from j. From the unripe nuts is obtained the oil of j.

JUNIUS, pseudonym of contributor of *Letters of Junius* to *Public Advertiser*, London, 1769-72; attacked George III. and his ministers in a way that showed the author knew the inner secrets of the government; attributed to several politicians, Burke, Wilkes, Temple, Horne, Tooke, etc., especially Sir Philip Francis, enemy of Warren Hastings. As lit. the letters are bombastic and cheaply rhetorical, arrogant, and scurrilous, although tricks of style and rhythm to some extent redeem them.

JUNIUS, FRANZ, two Huguenot scholars.—(1) the elder (1545-1602) made a famous translation of the Old Testament (1590). (2) son of the above; a theologian and an authority on Old English and the old Teutonic languages.

JUNKERS, the political party name given in Germany to the class of young nobles of military spirit who supported Bismarck before the Franco-Prussian War.

JUNO, see HERA.

JUNOT, ANDOCHE, DUKE OF ABRANTES (1771-1813), Fr. soldier; served in Italy and Egypt under Napoleon; in 1807 commanded Fr. force which invaded Portugal and captured Lisbon; gov. of Portugal, 1807; expelled by Wellington.

JUNTA, Spanish word for an assembly of men.

JUPITER, the largest planet; mean distance from sun, 483 million miles; period, 11·86 years; rotation period, about 10 hours; diameter, nearly 11 times that of earth; has five satellites, whose orbits lie almost in that of J.; surface shows belts of dark and light shade, which are usually parallel to each other, undergo quick changes, and seem to merge into one another. Different spots, even in the same latitude, have different periods of rotation, and hence it is reasonable to suppose we see the gaseous envelope of the planet, and not its actual surface. The great 'Red Spot' of J. (first observed, 1877) has persisted up till now, though it has often faded and been lost since then. The spot is to be found at the southern edge of the great equatorial belt. From rapid changes which constantly take place in J.'s atmosphere, it is seen that J. itself must possess great internal heat.

JUPITER, JOVE, identified with GK. Zeus, was the chief deity of the Romans. He was regarded as the lord of heaven, wielding thunder-bolts and casting lightning. His chief temple as guardian of the Rom. people was situated on the Capitol, and his formal title was J. Optimus Maximus. At the temple of J. on the Capitol ended the great triumphal processions, and the victorious general sacrificed white oxen to the god.

JURA (*c.* 47° N., 6° 30′ E.), mountain range stretching from N. E. to S. W. along borders of France and Switzerland between Rhine and Rhone for nearly 200 miles; forms a high plateau rising in several parallel chains to heights of

from 5000 to over 5600 ft. above sea-level. Highest peaks are Crêt de la Neige and Reculet, both over 5600 ft., La Dôle and Mont Tendre, over 5500 ft. Climate varies with elevation. N. part is well wooded, and chain is crossed by several railways. Rivers rising here are Ain, Creuse, Doubs, Loue, Orbe, some of which disappear into ground, reappearing at considerable distance. Geological composition is chiefly limestone, range giving its name to *Jurassic* system; caves frequently occur, some of which have fine stalactites. The GERMAN JURA begin at the Rhine and run N. W. for some 300 miles to the Main valley, in two ranges—the *Schwabischer Jura* and the *Frankischer Jura*.

JURA (46° 45′ N., 5° 40′ E.), E. department France; area, *c.* 1950 sq. miles; drained by Doubs, Ain, Orbe; large forests; vines, cereals, cheese, salt. Pop. 1921, 229,062.

JURA, (55° 57′ N., 5° 55′ W.), mountainous island, Inner Hebrides, Scotland.

JURASSIC, series of Mesozoic rock, which includes the Lias and overlies the Oolites; well developed in Jura Mts.—hence name; found in Yorkshire from Tees to Filey, Lincolnshire, across Midlands to Bristol Channel, and again at Lyme Regis; also seen in Germany, Caucasus, Spain, and India. *Life of period*—Land plants; conifers, ferns, cycads, and equisetums. Animal life: Foraminifera, corals, crinoids, and starfish. Crustaceans: decapods and crabs. Insects: forms of grasshopper, cockroach, earwig, ant, and fly. Reptiles: very abundant, including turtles, lizards, and crocodiles. Sea saurians: Ichthyosaurus, Plesiosaurus.

JURAT, term applied to certain officials in Channel Islands.

JURIEU, PIERRE (1637-1713), Prot. theologian, ordained in Anglican Church, then in France; prof. at Sedan and Rotterdam; an able controversialist.

JURISPRUDENCE, (Lat. *jurisprudentia,* 'knowledge of the law') is best defined as 'the formal science of positive law'. In anc. Rome, republican and imperial, the *jurisprudentes* were men skilled in law, who foretold what the legal issue would be in novel and doubtful cases, and the *jurisprudentia* was the body of law built up and developed by their interpretations. But in modern times John Austin's *Province of Jurisprudence Determined,* and the work of Holland, Maine, Pollock, and others, have brought a general acceptance of the definition above. According to Austin, it was the function of jurisprudence to distinguish between laws proper and improper; to determine what are the essential elements in our conception of law; to analyze and define the relations of law to rights and duties. Jurisprudence has nothing to do with what are called 'natural laws,' and it carefully distinguishes between 'commands' and 'laws,' and between positive law and the 'laws of God,' 'the dictates of the heart,' the 'light of reason,' and all other similar authorities that claim the obedience of man. Positive law is not exclusively a matter of legislation; it may be common law, the result of custom, or it may be the work of judicial decisions—judge-made law.

Although the great 'analytical' school as it is called, represented by Hobbes and Austin and their followers, maintains that jurisprudence is only concerned with positive law, another school, the natural law jurists, argue that law is antecedent to the state, is to be grasped by pure reason, and is only the application of ethics to everyday life. This school has the foundations of its doctrines in the Stoic philosophy and the Roman jurisprudence, and it was predominant in the 17th and 18th centuries, when the natural rights 'of men,' a mythical state of nature, and the republican 'democracies' of classical Greece and Rome were the watchwords of political reformers. In the 19th cent. *natural* rights had to be given up before the scientific knowledge that revealed evolution, and all the false teaching built up on an alleged primitive happiness in nature crumbled. Only in the U. S. today can any considerable number of natural-law jurists be found.

Analytical Jurisprudence, by insisting on the importance of authority, as a condition of positive law, helped to get an answer to the question that troubled legal and political philosophers in the 17th cent.—viz., Where sovereignty resides? It showed that authority was here and there strong enough in custom to compel obedience to law, and that in other places it was found in the duly qualified legislator or the duly appointed judge. Thus the influence of this jurisprudence can be seen very plainly in the theories and practice of Brit. jurisprudence—Whig constitutionalists, with their checks and safeguards in the relations of the crown, and Parliament, and people. Yet Hobbes, the first to declare the principles of analytical jurisprudence, was equally convinced that absolute monarchy alone gave the stable authority that could ensure obedience to law.

Comparative Jurisprudence is concerned with historical methods and the study of the evolution of law. It demands that each existing law shall be studied

historically and scientifically, and that the various national systems shall be compared at similar stages of development. It seeks to learn the origin of all legal institutions. Then by the knowledge of origins and by comparisons the normal course of legal development may be discovered, and that which is universal and human be distinguished from that which is local, tribal, or peculiar to a particular nation or a special stage of development.

JURY, a number of men selected according to legal rules and sworn to inquire into and decide on facts, and to give a true verdict, according to the evidence legally placed before them. In the courts of justice there are three varieties of juries: grand juries, special juries, and petit or common juries. A grand jury is usually chosen from citizens of a high intelligence to pass upon special cases and to determine whether or not there is sufficient evidence for indictment. The petit or common jury usually consists of 12 men, and the verdict usually must be unanimous. In some states, however, a verdict of a majority of jurors is permissible. After the passage of the XIX. Amendment, women were chosen to serve on juries in most of the states.

JURY MAST. See SAILS AND RIGGING.

JUS GENTIUM, see ROME (LAW).

JUS PRIMÆ NOCTIS, supposed mediæval privilege of overlord to deflower vassal's daughters on their wedding night; relic of barbarism; no traces of legal foundation can be discovered.

JUSSERAND, JEAN ADRIEN ANTOINE JULES (1855-), Fr. author and diplomatist; *b.* at Lyons; ambassador to U. S. since 1902; brilliant critic of Eng. literature; authority on Shakespeare; has pub., among others, the following books: *Theatre en Angleterre jusqu'á Shakespeare*, 1887; *English Wayfaring Life in the Middle Ages*, 1889; *The English Novel in the Time of Shakespeare*, 1890; *A Literary History of the English People*, 1895-1904, and *With Americans of Past and Present Days*, 1916.

JUSSIEU, DE, Fr. family of botanists. —ANTOINE (1686-1758) edit. Tournefort's *Institutiones rei herbariee.* BERNARD (1699-1777) arranged in plants Trianon. ANTOINE (1748-1836) wrote *Genera Plantarum*, foundation of modern classification of plants. ADRIEN (1797-1853) wrote *Botanique*; a hand-book. LAURENT (1792-1866) wrote *Simon de Mantua.*

JUSTICE OF THE PEACE, 'J. P.', title of the petty county or borough magistrate, who sits to administer summary justice in minor matters, and to see that the peace is kept; first app. by Edward I., 1327.

JUSTICIAR (judge).—From reign of Henry II. king's chief minister was called chief j.; originally officer who acted in king's absence; after 1231 j.'s place was taken by chancellor.

JUSTICIARY COURT, highest Scot. criminal court; usually sits in Edinburgh; circuit courts 6 times a year in Glasgow, 4 in Perth, Aberdeen, Dundee, 2 in Iverness, Ayr, Jedburgh, Dumfries; judges are those of Court of Session; no appeal to House of Lords.

JUSTIFIABLE HOMICIDE, see MURDER.

JUSTIN I. (450-527), Roman emperor, 518; uncle of Justinian.

JUSTIN II. (d. 578), Rom. emperor, succeeding his uncle Justinian, 565; defended Italy against Lombard attacks

JUSTIN MARTYR (fl. II cent. jone. of 'Apostolic Fathers'; *b.* in Samaria; lived at Ephesus; after being Stoic and Pythagorean, converted to Christianity; then went to Rome, where he was martyred *c.* 165; addressed his *Apology* to Emperor Antoninus, wherein he meets Pagan attacks on Christianity; wrote also *Dialogue with Trypho the Jew*, very valuable for history of early Christian thought and worship, and for Old and New Testament Canon.

JUSTINIAN I., FLAVIUS ANICIUS JUSTINIANUS (483-565), Byzantine emperor; *b.* at Tauresium, Illyria; of barbarian extraction, but was adopted by his uncle, Justin I., whom he succ. on imperial throne, 527. By the aid of his wife Theodora, who exercised great influence over him, and of his two great generals, Belisarius and Narses, who subdued the Vandals and Ostrogoths in Africa and Italy, he restored these countries to the Byzantine empire; but his war against Chosroes of Persia was unsuccessful, and he could only obtain peace by agreeing to pay an annual tribute. After the foreign wars the most notable event of his reign was the outbreak of the Nika riot at Constantinople in 532, which was eventually put down with great severity.

J. is best known for the thorough revision of the whole system of law which he caused to be made; he appointed commissioners to draw up codes both of the *jus novum*, or later imperial statutes, and of the *jus vetus* or earlier ordinances;

this resulted in the publication of four legislative works, which under the collective name of *Corpus Juris Civilis*, constituted the Rom. law in Europe for the next four cent's. The *Corpus Juris Civilis* includes: (1) The *Institutiones*, an introductory treatise, pub. 533; (2) the *Codex Constitutionum*, a compilation of imperial ordinaces, pub. 529; (3) the *Pandects*, or *Digesta*, a selection of earlier decrees and writings, pub. 533; and (4) the *Novellæ Constitutiones*, containing subsequent reforms and amendments and pub. between 535 and 565. J.'s reign was also marked by the building of many forts and strengthening of the Empire's frontiers; he also built many palaces and churches, of which most famous is the Church of St. Sophia at Constantinople, now used as a mosque. His extravagance in these matters made necessary the severe taxation of his subjects, which caused revolts on various occasions. During most of his life J. was an orthodox Christian, and persecuted heathens and heretics with considerable severity.

JUSTINIAN II. (669-711), Eastern emperor, 685 to 695, when he was deposed; ruled again from 704.

JUSTINUS JUNIANUS, wrote history of Macedonia; lived (probably) in II. cent.

JUTE (*Corchorus capsularis*), an annual plant belonging to the family of Brit. lime tree (*Liliaceæ*). It produces little-branched stems, growing to a height of about 12 ft., and a thickness of ½ in. On these are borne fairly large leaves, lance-shaped, and with serrate edges. The flowers are yellowish in color, and occur in clusters. The plant is a native of Bengal, and has been cultivated in India for many thousand years. Of late, attempts have been made to grow it in other tropical countries where the climatic conditions are suitable—it requires moisture, and an even, fairly high temperature. Economically it is important as yielding a fibre which may be manufactured into coarse cloth. In Bengal it is sown in March and cut four months later. The stems are freed from foliage, and rotted in slow-running water. After a few days they are beaten to break up the wood, and combed to separate out the bast fibre. This is pressed into bales for export. J. was first made known in 1795, but only in 1830 was much attention paid to it. In that year it began to be manufactured in Dundee, and since then Dundee has possessed the most extensive jute-mills in the world. It is used for the manufacture of sacking and other coarse fabrics. For India it is fortunate that a great decrease in domestic consumption —due to the introduction of cotton, which soon usurped the place of jute as a clothing for the natives—was accompanied by an enormous increase in export trade.

JUTIGALPA, Juticalpa (14° 55′ N., 85° 30′ W.), town, Honduras, Cent. America. Pop. 19,000.

JUTLAND (56° 30′ N., 9° 20′ E.), peninsular province, Denmark; area, c. 9,898 sq. miles; surface generally level, rising 560 ft. in S. E.; large part of area under wood; drained by Gudenaa, Skjerne, and other streams. Chief centre of Baltic trade is Aarhus. Pop. (1921), 1,498,479.

JUTLAND, Battle of (or Skager-Rack, Ger.). In May 1916 the German *moral* was at a low ebb. During the last week of April the government had been compelled to submit to President Wilson's ultimatum on the submarine question, the much advertised U-boats had made no decisive stroke, the Verdun losses had been appalling, a Russian revival was possible, and the German people were suffering severly from hunger. A victory of some kind, preferably a naval victory, was needed to brace the nation for fresh efforts. Admiral von Scheer had succeeded Admiral von Pohl as commander-in-chief of the navy, and he favored a more active policy than had hitherto obtained. Accordingly, on May 30, the High Seas Fleet left the Kiel Canal in force. Its object, according to the admiral, was to attack Brit. cruisers and merchant ships in and outside the Skager-Rack, and to cut off, if possible, any division (presumably Sir David Beatty's battle-cruiser squadron) that might be sent for their protection. The German fleet sailed in two divisions: in the van was von Hipper's battle-cruiser squadron of five ships with attendant cruisers and destroyers; and some 60 m. astern, the battle fleet of some 19 or 20 battleships, 20 light cruisers, and other details — practically the whole sea-might of Germany.

The location of unusual wireless activity across the North Sea revealed to the authorities at Whitehall that the German fleet was leaving its harbors. Sir John Jellicoe at Scapa Flow, and Sir David Beatty at Rosyth, were at once informed. Jellicoe's Grand Fleet sailed in the afternoon of the 30th, and Beatty's battle-cruiser squadron issued from the Forth toward midnight. Beatty's force included, in addition to his six battle-cruisers, three squadrons of light cruisers, four destroyer flotillas, and the 5th Battle Squadron, under Evan Thomas. The Grand Fleet consisted of some 24 battleships, a squadron of battle-cruisers

under Hood, two of light cruisers, and three flotillas of destroyers. The total number of British ships in the battle was 151. About midday on the 31st Beatty's force, which had been scouting to the southward, turned N. to join the Grand Fleet, then some 75 m. distant. At 2.35 *Galatea*, on the extreme right of the light cruisers, which were spread out from E. to W. ahead of the battle-cruisers, sighted smoke to the eastward. Von Scheer says that one of his scouts had been sent to the westward to examine a steamer, and that it was this scout which revealed him to the enemy. Otherwise the course of the Germans would have carried them past the British forces. Two squadrons of Brit. light cruisers sped eastward to investigate; a seaplane was sent up, and reported that behind the enemy light craft were five battle-cruisers. At 3.30 Beatty formed line of battle, with the battle-cruisers leading and the battle-ship squadron following at about half a right angle to port, and steered for the Horn Reef, so as to place his force between the enemy and his base. At 3.48 the action began at a range of 18,500 yds. The battle that followed will best be described in sections.

(1) *The Southward Chase.*—Von Hipper at once headed S. for the main German fleet, Beatty following on a parallel course, at a range of about 14,000 yds. At 3.48 a chance shot exploded the magazine of *Queen Mary*, and she sank almost instantaneously with all hands. A similar disaster followed at 4.18, when *Indefatigable* went down, Beatty's main force being reduced to four ships as against von Hipper's five. At 4.8 Evan Thomas's squadron came into action at a range of 20,000 yds. Meanwhile, at 4.1, two flotillas of British destroyers and one squadron of light cruisers moved out to make a torpedo attack on the enemy's capital ships. Almost at the same moment enemy flotillas moved out for a like purpose, and the two forces met before either had reached a position suitable for discharging their torpedoes. A spirited engagement followed, and two of the enemy were sunk. Three Brit. destroyers pushed on to make a broadside attack, and came under fierce fire. Two enemy destroyers were sunk. *Nomad* was disabled, and afterwards lost; *Nestor* and *Nicator* held on to 3,000 yds. of the German Battle Fleet, which was sighted by *Southampton* at 4.38. Twenty minutes previously the third ship of von Hipper's line was seen to be on fire. *Nestor* was stopped. *Nicator* escaped, and rejoined.

(2) *The Northward Run.* It was now clear that the enemy's tactics were to lure Beatty within reach of the German High Seas Fleet, and, by dint of overwhelming preponderance of gun power, destroy him. Beatty had but four capital ships, the 5th Battle Squadron being out of range, and obviously even with that assistance he could not fight the whole Ger. fleet. He therefore turned his ships, one by one, and von Hipper followed his example, with von Scheer's fleet tailing behind him. The northward run now began (4.42), the British ships standing out sharp against the clear horizon, while the Ger. vessels were shrouded in mist. At 5.10 *Fearless* reported one of the enemy heavy ships on fire. A critical hour followed while Beatty led the enemy northward towards Jellicoe, who had 60 per cent. more ships than the Germans, and over 200 per cent. greater gun power. Having the legs of the enemy, Beatty was able to keep ahead of von Hipper and prevent von Scheer from bringing his broadsides to bear. Between 5.30 and 6 the visibility from the Brit. vessels grew worse, but the German advantage was neutralized by Beatty's speed. During this phase destroyers made attacks, and *Moresby* claimed a victim. At 5.35 von Scheer began hauling round to the E.—*i.e.*, gradually away from the Brit. line. It is supposed that by this time he had received information of the appearance of the Grand Fleet. At 5.56 Jellicoe's leading battleships were sighted.

(3) *Crossing the T.*—At six the Grand Fleet was 5 m. to the N., approximately 12 m. from the enemy. Beatty now realized that at full speed he could head the Ger. fleet, so that by the time the Grand Fleet had deployed he would be in a commanding position on the bow of the enemy's van. He supposed that the twenty-four ships of the Grand Fleet would outflank the enemy at both ends of his line. At 6.21 Hood, returning from a fruitless search for the enemy, led his battle-cruiser squadron into action, after sending forward *Chester* as a scout. Almost immediately his flagship, *Invincible*, was sunk. Her consorts, however, with Beatty's vessels drove the leading Ger. ship out of the line and 'crumpled up' the head of the German fleet. During this phase of the battle *Defence* was sunk, and *Warrior* was so disabled that she went down during the night.

(4) *Deployment of the Grand Fleet.*—Information as to this phase of the battle is sadly lacking. It is, however, surmised that Jellicoe, instead of following in Beatty's wake with his six divisions then on a S. E. by S. course, formed line on the starboard wing which took the vessels out of action altogether. Shortly before 7 the fleet was reformed into a new line, at an angle of 45° to starboard of its former course. The line

was completed shortly after 7.12, when the opposing fleets were roughly parallel with each other. It is said that at this time Beatty made a signal to the commander-in-chief submitting that, if the leading squadron of the Battle Fleet would follow him, the enemy might be annihilated. At 7.12 von Scheer sent out his destroyers to make an attack on the battleships. At 7.23 Jellicoe turned his ships eight points, and proceeded at right angles to his former course for eight minutes. He then resumed his course, but at 7.40 another torpedo attack produced a similar manœuvre. This enabled von Scheer, under cover of dense smoke clouds, to get his whole fleet on to a south-easterly course and escape. At 7.45 the mist came down, and the enemy was lost to sight.

(5) *Searching for the Enemy.*—At 7.58 the 1st and 3rd Light Cruiser Squadrons were spread out and ordered to sweep westward and discover the whereabouts of the head of the enemy's line. They soon came within range of the enemy, and Beatty turned west to support. Action began at the short range of 10,000 yds. The leading enemy ships, assailed by *Lion*, turned away on fire. *Princess Royal* set fire to a three-funnelled battleship, and *New Zealand* and *Indomitable* reported that the third enemy ship had been forced out of the line, was heeling over, and also on fire. Then the mist descended, and the enemy was last seen by *Falmouth* at 22 minutes to 9. At 9 o'clock Beatty fell back to the line of the Grand Fleet, and dispositions were made for the night.

(6) *The Night Attack of Destroyers.*—At 10.20 the 2nd Light Cruiser Squadron got into action with five enemy cruisers, and at 11.30 *Birmingham* sighted several heavy ships steering s. or w.s.w. At 12.30 13th Flotilla reported a large vessel which opened fire and disabled *Turbulent*. At 12.35 *Morseby* sighted four pre-Dreadnoughts, and fired a torpedo; two minutes later she felt the shock of an explosion on board the ship ahead at. The other destroyers also had opportunities of using their torpedoes, three of which were probably successful, and a fourth resulted in the blowing up of a ship. During the night *Black Prince* and the following Brit. destroyers were sunk: *Tipperary*, *Ardent*, *Fortune*, *Shark*, *Sparrowhawk*, and *Turbulent*.

(7) *The Next Day, June* 1.—'At daybreak, June 1st,' says Lord Jellicoe in his dispatch, 'the Battle Fleet, being then to the southward and westward of the Horn Reef, turned to northward in search of enemy vessels, and for the purpose of collecting our own cruisers and torpedoboat destroyers. . . . The Brit. fleet remained in the proximity of the battlefield, and near the line of approach to German ports, until 11 a. m. on June 1. . . . The enemy, however, made no sign, and I was reluctantly compelled to the conclusion that the High Seas Fleet had returned to port. Subsequent events proved the assumption to have been correct.

Controversy will probably rage about this battle for generations to come, but until a narrative compiled from official records is published, criticism must be withheld. Regarded simply as a battle the result was indecisive, the enemy inflicting greater losses than he suffered, and regaining his ports with the bulk of his forces. The Ger. losses were: *Lützow*, *Pommern*, *Wiesbaden*, *Rostock*, *Elbing*, *Frauenlob*, and five destroyers. The Brit. loss has been indicated above. Never again, however, did the Ger. fleet challenge, and the ignominous surrender in the Forth on Nov. 21, 1918, may be regarded as the aftermath of the battle. On the other hand, it is argued that Jellicoe's policy of 'safety first,' though successful in the long run, prolonged the war; enabled the enemy to develop his submarine campaign, and sink about five and a half million tons of Brit., Allied, and neutral shipping: closed the Baltic and prevented the resources of the Clyde and Tyne being utilized for the production of merchant shipping.

JUVENAL, Decimus Junius Juvenalis (*c.* 60-140 A. D.), Rom. satirist. There is not a reliable biography extant, but the following statements, taken from the many existing 'lives,' are probably near the truth: *b.* Aquinum, *s.* of prosperous freedman; successful as amateur declamator; aroused anger of prominent actor, favorite of emperor; banished (possibly to Egypt, in military capacity) at an advanced age. An inscription, relating to the dedication of an altar to Ceres by Junius Juvenalis, was found at Aquinum; this man, who may have been the poet, was tribune of 1st Dalmatian cohort and provincial magistrate.

J.'s *Satires*, 16 in number (collected into 5 books), were probably composed between 100 and 130; they deal mainly with abuses prevalent in Domitian's reign; the sixth is slashing condemnation of woman.

J. possesses considerable graphic and descriptive force; undoubtedly coarse in parts, and his intimate knowledge of contemporary vice, coupled with a reference in Martial, seem to indicate that his own character was not above reproach. He has, however, a genuine hatred of the tyranny and savage cruelty and, above all, the vile system of espionage (*delatio*) which at that time characterised the Rom. Empire.

K

K 11th letter of alphabet, was evolved from Egyptian symbol for a bowl; generally replaced by *C* in Lat. alphabet derivatives; first seen in England in XII. cent.

KABARDIA (43° 20′ N., 43° 30′ E.), district, Terek, S. Russia; horses bred; inhabited by Circassian race. Pop. *c.* 70,000.

KABBA (*c.* 7° 55′ N., 6° E.), province, Brit. N. Nigeria; cereals, rubber, tobacco, indigo, tin. Pop. *c.* 70,000.

KABBALAH (late Hebrew, *received lore*), name given to a body of Jewish theosphy and myticism, traditionally supposed to have been handed down from the patriarchs. It owes its origin to a conglomeration of Jewish, Gk., Egyptian, and Babylonian elements in Alexandria about I. cent. B. C. The chief doctrine of the K. is its cosmogony.

KABINDA, CABINDA (*c.* 5° S., 12° 25′ E.), detached part of Portug. colony of Angola, W. Africa, on coast between Belg. and Fr. Congo. Chief town, KABINDA (5° 35′ S., 12° 15′ E.). Pop. *c.* 10,000.

KABIR (d. *c.* 1449), Ind. reformer; at first Muhammadan; after his death both Muhammadans and Hindus asserted he belonged to them, and his teaching was undoubtedly syncretistic; believed in a personal God, and thought falsehood was the root of all evil; thought by some that his teaching was ultimately in part derived from Christianity, which penetrated into India.

KABUL (34° 53′ N., 69° E.), capital, Afghanistan (*q.v.*), on K. River; an ancient town containing high citadel and Emir's palace. Situated on trade route between Central Asia and Punjab, K. has large transit trade; was known to Greeks through Alexander the Great by Ind. campaign; was seized by Timur, 1394; by Nadir Shah, 1739; destroyed by British, 1842; occupied by Lord Roberts, 1880. Pop. *c.* 150,000. See Map of Asia.

KABUL RIVER (34° 20′ N., 70° 50′ E.), river, Afghanistan; source in Hindu Kush; joins Indus.

KABYLES, Berber tribes of N. Africa, akin to, but not the same as, Arabs. They belong to Islam, and have no written lit.

KACH GANDAVA, KACHHI (28° 30′ N., 68° 10′ E.), level district, Baluchistan. Pop. 86,000.

KACHIN HILLS (*c.* 26° 15′ N., 97° 30′ E.), hill region, N. Burma, Farther India; area, *c.* 19,180 sq. miles; crossed by several mountain chains; watered by Irrawady; inhabited by numerous native tribes. Pop. 66,000.

KADIAK, or KODIAK, an is. off the E. coast of Alaska, from which it is separated by the Shelikof Strait. There are several salmon canneries, and trade is very brisk. St. Paul, a village on the N. E. coast, is an important centre for furs. See Map of Alaska.

KADUR (*c.* 13° 30′ N., 75° 30′ E.); district, Mysore, India; well forested. Pop. *c.* 367,000.

KAEMPFER, ENGELBRECHT (1651-1716), Ger. physician and traveller; went in an embassy from Charles XI. of Sweden to Persia, travelling through Russia; voyaged to Arabia, India, Java, Siam, and Japan, where he remained two years; returned to Europe, 1693, and practised med. in his native town, Lemgo.

KAEMPFFERT, WALDEMAR BERNHARD (1877-), editor. Born in New York City. Bachelor of Science, 1897, College of the City of New York. Bachelor of Laws, 1904, New York University. 1903 admitted to New York Bar. Registered patent attorney. 1897-1911 assistant editor of magazine. 1911-1915 managing editor. Editor 1915-1920. Vice president and director of engineering service since 1920 of an advertising concern. Author of: *History of Astronomy*, 1910; *New Art of Flying*, 1911. Translator; *Gas Engines and Producer-Gas Plants* (by Rodolphe E. Mathot), 1905. Wrote for American and European engineering and scientific magazines.

KAFFA (*c.* 7° 30′ N., 36° 40′ E.); region N. E. Africa; tributary to Abys-

sinia; produces coffee; chief towns, Bonga, Jiren. See Map of Africa.

KAFFIR CORN, a kind of millet, which was cultivated originally in Africa, and has been transplanted to other countries.

KAFFIRS (sometimes spelt *Caffres*), an African Bantu race, which, including Zulus and Kaffirs proper, forms the bulk of the natives of S. Africa. The name is Arabian, and signifies 'infidel,' *i.e.*, who refuses the creed of Islam. A. K. *kraal* consists of conical huts, and while the men mind the cattle the women work on the land. At intervals throughout the XIX. cent. Great Britain was engaged in suppressing this stalwart and warlike people, and in annexing their land.

KAFIRISTAN (35° 30′ N., 71° E.), district, Afghanistan. Its history, both early and modern, is veiled in obscurity, although country is occasionally mentioned by travellers. K. came into contact with British in XIX. cent. Brit. government formally acknowledged it to be under Afghan control in 1895, since when it has been ruled by the Amir, concerning whose methods of enforcing his authority and the Muhammadan religion the rest of the world remains in ignorance. K., roughly speaking, is bounded by Hindu Kush Mt's, Chitral, Kabul, and Panjshir Rivers; area, *c.* 5,000 sq. miles. Surface is mountainous, with numerous narrow glens and valleys between the hills; drained by various affluents of Indus and Kabul, of which largest is Bashgal. Climate is hot in summer, severe in winter. See Map of Asia.

KAGERA (0° 59′ S., 30° 50′ E.), river, E. Africa; head-water of Nile; enters Victoria Nyanza.

KAGOSHIMA (35° 10′ N., 139° 36′ E.), town, Kiusiu Island, Japan; arms, cotton, pottery; bombarded by British, 1863. Pop. (1919), 92,306.

KAHLER, HUGH MAC NAIR (1883-), writer. Born in Philadelphia, Pennsylvania. 1904, Bachelor of Arts, Princeton College. Founder, publisher and editor of America (now American Industry in Spanish). How to Export. 1909 organized Latin American Chamber of Commerce. 1910 American Trade Export Association. 1910-1915 writer on advertising and selling and export topics. Author of: *The Six Best Cellars* (with Holworthy Hall), 1919; *Babel*, 1921; *The East Wind*, 1922.

KAHLUR, Bilaspur (31° 20′ N., 77° 50′ E.), native Ind. state in Punjab. Pop. *c.* 95,000.

KAHULAUI, see Hawaiian Islands.

K'AI-FENG FU (34° 50′ N., 114° 35′ E.), walled town, capital of Honan, China; near Hwang-ho R.; gov.'s seat; several mosques. Pop. *c.* 180,000.

KAHN, OTTO HERMANN (1867), a German-American banker, *b.* in Mannheim, Germany. He received a collegiate education in his native country, learned banking there, was for five years employed in a bank in London, England, and came to the United States in 1893, being connected for two years afterwards with the banking firm of Speyer & Co., in New York City. Since 1907 he has been a member of the banking firm of Kuhn, Loeb & Co.

KAIAK, or **KAYAK,** a boat used by Eskimos in fishing. It is usually about 18 feet long and 18 inches wide, and is covered with skins and closed at the top, except for a hole in the center in which the boatman sits.

KAILAS (31° 4′ N., 81° 15′ E.), Hindu sacred mountain, Tibet.

KAIN—(1) (33° 40′ N., 59° 5′ E.), walled town, Khorasan, Persia; ruined mosque and castle. Pop. *c.* 4,000. (2) sub-province, Khorasan, Persia. Pop. *c.* 150,000.

KAINITE ($K_2SO_4,MgSo_4,Mgcl_2,6H_2O$) a mineral found in masses in the Strassfurt deposits and used as valuable potash manure.

KAIRA—(1) (22° 50′ N., 72° 50′ E.), district, Bombay, India; rice, cotton; often ravaged by famine. Pop. 720,000. (2) (22° 46′ N., 72° 37′ E.), walled town, K., India; also called Kheda. Pop. 11,000.

KAIRWAN, Kairouan (35° 40′ N., 10° 3′ E.), ancient walled town, Tunisia, Africa; sacred to Muhammadans; has citadel and many beautiful mosques, of which most remarkable are Mosque of the Companion (Prophet), which stands beyond walls, and that of Okba, founder of K; visited by many pilgrims. Pop. *c.* 24,000.

KAISER, see Cæsar, Germany.

KAISER WILHELM CANAL. See Kiel Canal.

KAISER WILHELM'S LAND, see New Guinea.

KAISERSLAUTERN, tn., Bavaria, Germany (49° 27′ N., 7° 47′ E.), 42 m. W. of Mannheim; manufactures iron goods, cotton, woolens. Here Prussians defeated French (1793-4); during World War bombed by Brit. airmen on many occasions. Pop. (1919), 55,707.

KAISONG, or Song-do, tn., Korea (38° 25′ N., 128° 30′ E.), 35 m. N. W. of Seoul; was cap. from 910 to 1232; ginseng and oiled paper. Pop. 60,000.

KAKEMONO, name for Jap. picture on paper or silk, with roller at foot. They are exposed for a day only at a time, after which they are rolled up and put away. A *gaku* is a picture stretched on a frame. A folding screen with pictures painted thereon is called a *biyobu*.

KALA-AZAR, or Dum-Dum Fever, tropical disease accompanied by fever and anæmia; it resembles malaria, and is due to a parasitic protozoön. The treatment, as in malaria, is to give quinine promptly, in doses up to 30 grs. in twenty-four hours in the early stages, and continued until slight singing in the ears is experienced, the dose being then gradually reduced; treatment being continued, however, for about three months.

KALAHANDI (*c.* 19° 35′ N., 83° E.), native state, Bihar and Orissa, India. Pop. *c.* 355,000.

KALAHARI DESERT (*c.* 20° to 27° S., 19° to 25° E.), vast steppe region, N. of Cape Province, S. Africa, with elevation of 3,000 to 4,000 ft.; almost waterless; inhabited by agricultural race called *Bakalahari*, and by nomadic Bushmen or hunters; many parts covered with vegetation; cattle raised, crops grown; big game abundant.

KALAKAUA I., DAVID (1836-1891)' King of Hawaii. He succeeded to the throne in 1874. In 1887 he was compelled against his wishes, to grant a constitution which took away many of his rights.

KALAMATA (37° 2′ N., 22° 7′ E.), town, Greece; archiepiscopal see; exports silk and olive oil. Pop. 14,500.

KALAMAZOO, a city of Michigan, in Kalamazoo Co., of which it is the county seat. It is on the Michigan Central, the Lake Shore and Michigan Southern, and other railroads, and on the Kalamazoo River. It is a trade center for a large agricultural region which contains the most important celery market in the world. The city is of great industrial and commercial importance. It has over 250 mercantile houses and over 70 distinct industries. The public institutions include Kalamazoo College, Michigan Female Seminary, State Insane Asylum, two hospitals, a childrens' home, Home for Girls, Home for Feebleminded Children, and an Industrial School Home. Pop. (1920), 48,487.

KALAMAZOO COLLEGE, a co-educational institution in Kalamazoo, Michigan, founded in 1855. It is under the auspices of the Baptist Church. There were in 1923 about 365 students and 27 members of the faculty.

KALAT (29° N., 66° 36′ E.), capital and fortress, Baluchistan; citadel contains khan's palace; occupied by British, 1839. K. district had pop. 421,000.

KALB, JOHANN, BARON DE (1721-1780), a German soldier; *b.* in Bavaria. He entered the French army, in 1743, and rose to the rank of brigadier general. In 1768, he came to the United States on a secret mission and returned again with Lafayette, in 1777. He was commissioned major general of the Continental army, and served in New Jersey and Maryland. He was mortally wounded at the Battle of Camden, S.C., on August 16, 1780.

KALE. See Cabbage.

KALEDIN, General (*d.* 1918); Russian soldier of Cossack birth; commanded one of Russian armies during Brussilov's offensive (1916), and succeeded that general as commander of 8th Russian Army when he was chosen to succeed Ivanov. His masterly conduct of the Volhynian battle and the capture of Lutsk gained for him the title of 'Hero of Lutsk.' After outbreak of the revolution (1917) was leader of Cossacks, who elected him hetman, or commander-in-chief. Died by his own hand on hearing of Alexeieff's defeat on the Don.

KALEIDOSCOPE, optical instrument invented by Sir David Brewster, 1815; consists of tube containing mirrors having their reflecting surfaces inclined at 60° or other sub-multiple of 360°; colored glass pieces at foot of tube by reflection assume beautiful regular forms, which vary when tube is shaken.

KALGAN (40° 55′ N., 114° 58′ E.), fortified town, Chih-Li, China; has extensive transit trade. Pop. *c.* 80,000.

KALGOORLIE (30° 50′ S., 123° 19′ E.), town, Western Australia; goldfields; terminus of railway from Perth; is being linked by rail with South Australia. Pop. 7,000.

KALI (Hindu myth.), Ind. goddess, wife of Siva; wears a string of human heads round her neck.

KALIDASA (fl. *c.* 550 A. D.), famous Sanskrit writer; greatest work is drama *Sakuntala* ('The Lost Ring'), which has been translated into several European languages; second to his masterpiece is *Vikramorvasi* ("The Hero and the

Nymph'); two epics and several poems are also ascribed to him.

KALISZ. (1) Government, Poland (51° 44′ N., 18° 40′ E.); flat and sandy; many lakes and marshes; cereals, cattle raising. Area, 4,377 sq. m.; pop. 1,342,400. (2) Tn., cap. of above (51° 46′ N., 18° 16′ E.); brewing; ribbons, sugar, linen. During World War taken by Kornilov's troops (July 11, 1917). Pop. (1921), 44,753.

KALMAR (56° 39′ N., 16° 22′ E.), port and cathedral town, Sweden; former fortress. By *Union of K.*, 1397, Sweden, Norway, and Denmark were united as a single kingdom. Pop. (1921), 17,087.

KALMIA, a North American shrub, bearing rose or purple flowers. The *Kalmai latifolia* is known as mountain laurel.

KALMUCK, Kalmyk Steppe (45° 50′ N., 43° E.), region inhabited by Mongol race of same name, Astrakhan, Russia; area, *c.* 37,000 sq. miles; many Buddhist monasteries.

KALPI, Calpee (26° 6′ N., 79° 45′ E.), town, United Provinces, India; mutineers defeated here, 1858. Pop. 11,000.

KALUGA. (1) Government, Central Russia, bounded by Moscow on N. Iron, coal, and copper mined. Industrial establishments include ironworks, cotton, match, paper, and cloth manufactories, tanneries, distilleries, and oilworks. Area, 11,940 sq. m.; pop. 1,387,000. (2) City and episc, see cap. of above (54° 32′ N., 36° 18′ E.); manufactures candles starch, pottery, and agricultural machinery. Pop. 53900.

KALYAN (19° 13′ N., 73° 10′ E.), town, Bombay, India. Pop. 11,500.

KAMA, a river in Russia; is the longest tributary of the Volga. It rises in the government of Vyatka and flows W. through Ufa and Kazan, joining the Volga 40 miles below the city of Kazan. It is navigable for 930 miles, and is an important line of communication between Siberia and St. Petersburg. Its length is 1,172 miles.

KĀMA, or **KĀMADEVA,** of Hindu mythology, the god of love, the *s.* of Brahmā or Dharmā, and the *husband* of Rati (voluptuousness). He was destroyed by Siva, whom he attempted to seduce, but was afterwards re-born as the child Pradyumna (Cupid).

KAMCHATKA (51° to 61° 40′ N., 155° 40′ to 163° E.), peninsula, E. Siberia, E. of Sea of Okhotsk; area, *c.* 104,280 sq. miles; traversed by mountain range, of which notable volcanic peaks are Kluchevskaya, Belaye Sopka, Kojerevska; drained by K. and other streams; thermal springs; produces valuable furs; annexed to Russia, XVII. cent. Pop. *c.* 8,000. See Map of Asia.

KAMEHAMEHA, five kings of Hawaii: (1) (1753-1819), suppressed human sacrifice, encouraged trade; (2) (1797-1824), allowed establishment of American Protestant Mission; (3) (1814-54), introduced constitutional form of government; (4) (1834-63); (5) (1830-72), proclaimed new constitution, 1864.

KAMENETS PODOLSKIY, Podolian Kamenets (48° 36′ N., 26° 30′ E.), town, Podolia, Russia; R. C. and Gk. cathedrals. Pop. 47,000.

KAMENZ (51° 17′ N., 14° 5′ E.), town, Saxony. Pop. 12,000.

KAMERUN, OR CAMEROON, former Ger. colony, W. Africa (2°-13° N., 8° 40′-17° 20′ E.); extends between Bight of Biafra and Lake Chad, Brit. Nigeria, and Fr. Congo. Surface generally is plateau with low-lying coastal strip; highest towards W. Kamerun Mt., or Monga-ma-Loba (13,700 ft.), is an isolated volcanic mass; area drained by Sannaga and other rivers to sea, Shari to Lake Chad, Sanga to Congo, or to Benue (Nigeria). Coffee, cocoa, tobacco, rice, manioc, yams, and cotton are grown; rubber, palm kernels and oil, ivory, cocoa, copal, copra, and kola nuts exported; other products are iron, gold, and indigo. Railway mileage is 150. Kamerun was a Ger. colony from 1884 to 1918; in 1911 it was extended by inclusion of large tract from Fr. Congo as compensation for recognition of Fr. protectorate in Morocco. It was conquered by Fr. and Brit. troops during Great War Feb. 18, 1916, and has been divided between France and Britain, the share of the latter (*c.* one-fifth) lying in W., where the High Ridge of the Kamerun will provide an excellent health station for Nigeria. In the S. W. the people are Bantus; in the interior they are Sudanese. Area, 191,130 sq. m.; pop. 2,540,000.

Conquest of Kamerun.—Strategically the colony was hemmed in by the Allies, but it was defended by a well-trained, well-munitioned, and well-led force, and the great distances and the difficulty of communication made a concerted scheme of attack difficult. Without adequate preparation, two Fr. columns moved from Fr. Congo, and Brit. columns entered the country at several points on the Nigerian frontier late in Aug. 1914. These attacks, however, failed, the Allies being driven from Garua, and the post of Guerin within the Nigerian border being

captured. Naval operations were now decided on. The Brit. warships *Cumberland* and *Dwarf*, after bombarding Duala, the port, on Sept. 27, received its unconditional surrender, and with it command of the railway lines running N. and E. The Germans retreated by the valley of the Wuri and by the two railways. During Oct. the semicircle of conquered territory was rapidly widened, while isolated advances were made from the N. and S. frontiers. Jubassi, on the Wuri, was captured as well as Japoma, the terminus of the northern railway. All that was valuable to the enemy in Kamerun had now been lost. The wireless sattion had been destroyed, the coasts had been seized, and the Ger. forces were now reduced to defensive warfare in a difficult hinterland. By Oct. 26 an Anglo- French column, moving along the railway and ascending the Sannaga R. in boats, had occupied Edea, some 50 m. from Duala. The enemy retired to Yaunde, a station about 120 m. E. of Duala. Six weeks later the Germans made an unsuccessful attempt to recover Duala. Then followed an Allied advance in three columns against Yaunde (May), which was foiled by the thick bush and concealed machine guns. Nothing more was attempted until Oct. 1915 but in the interval a plan of campaign was elaborated to finish off the conqust. Fr. troops were to advance from Campo on the coast towards Yaunde, while other two columns advanced from the eastern railhead upon the same place. Meanwhile two columns from the Nigerian frontier were to concentrate on Banyo, a Belgian column was to invade from the Congo, and another force was to clear the country round the northern railhead. Near Banyo the Nigerian columns came into touch, and on Oct. 24 entered the town, and afterwards stormed the neighboring hill, to which the garrison had withdrawn. By the 26th the French, advancing from the Kelle R., were within 40 m. of Yaunde, and the Brit. column from the eastern railhead had threaded the tangled forest region and was in open country. Meanwhile the Nigerian columns had joined hands with the French from the Kelle R. Harried on all sides, the enemy completely gave way, and on New Year's Day, 1916, Yaunde was captured. Most of the retreating Germans escaped into the Span. territory of Rio Muni, where they were disarmed and interned. In the middle of Feb. the only Germans in Kamerun were perched on Mt. Mora, in the Mandara Mts. of the far north, and were being closely besieged. This unit did not yield until March 12, and with its submission the conquestof Kamerun was complete. As a result of the conquest the French not only reoccupied the 100,000 sq. m. of territory which they had been forced to yield in settlement of the Agadir crisis, 1911, but received additional territory almost half as large again. Great Britain retained the administration of some 70,000 sq. m. adjacent to her colony of Nigeria. See Map of Africa.

KAMIMURA, HAKONJI, a Japanese naval officer. He commanded the second squadron in the Russo-Japanese War, and, in 1914, took part in the attack of Tsing-Tau. He *d.* August 8, 1916.

KAMPEN (52° 33′ N., 5° 55′ E.), town, Holland; monastic ruins and fine mediæval church. Pop. 20,000.

KAMRUP (26° 24′ N., 91° 50′ E.), district, Assam, India; area, *c.* 3300 sq. miles; crossed by Brahmaputra; rice, timber. Pop 593,000.

KANAKAS, a term used by the Polynesians to describe themselves, *Kanaka*, or *Tanaka*, signifying 'man.' The word is used indiscriminately by white races to describe all South Sea Islanders. The islanders were formerly forced into labor and exported to the Queensland sugar plantations of Australia. The traffic was prohibited in 1906.

KANAOKA, KOSÉ NO (fl. 928-87), Jap. artist; most famous of ancient native master, who, breaking from Chin. influence, founded a school which remained dominant until XV. cent.; famed for landscapes, portraits, and animals.

KANARA, NORTH, CANARA (15° N., 74° 30′ E.), district, Bombay, India; area, *c.* 3930 sq. miles; produces rice. Pop. 455,000.

K., South (13° N., 75° E.), district, Madras; area, *c.* 4000 sq. miles. Pop. 1,134,713.

KANARIS, CONSTANTINE, CANARIS (1790-1877), Gk. leader; fought in Gk. War of Independence; victorious in several naval battles; Prime Minister, 1864-65.

KANAUJ (27° N., 79° 55′ E.), ancient Hindu town, United Provinces, India. Pop. 19,500.

KANDAHAR, CANDAHAR (31° 36′ N., 65° 35′ E.), town, Afghanistan (*q.v.*), commanding western entrance of Bolan Pass; traditionally founded by Alexander the Great; captured in turn by Mahmoud of Ghaznai, Jenghiz Khan, Timur, Baber, Abbas, and Nadir Shah; modern town founded by Ahmed Shah, XVIII. cent.; occupied by British, 1839, 1879-81; siege relieved by Lord Roberts, 1880. Situated on main route between India and Persia, K. trades largely with Herat, Samarcand, Bokhara, and Bombay; produces silks and felts in large quantities;

imports cotton goods; exports raw wool, fruit, vegetables, provisions. K. is encircled by walls; on high rock to N. is strong fortress.

KANDI (23° 58′ N., 88° 5′ E.), town, Bengal, India. Pop. 12,500.

KANDY (7° 18′ N., 80° 41′ E.), town, Ceylon; many native temples (one containing Buddha's tooth), and ruined royal palace. Pop. 27,000.

KANE, a borough of Pennsylvania, in McKean co. It is on the Baltimore and Ohio and the Kane and Elk railroads. It is situated on high ground and is a favorite health resort. Its industries include the manufacture of glass bottles and lumber. It is the seat of the Kane Masonic Hospital. Pop, 1920, 7,283.

KANE, ELISHA KENT (1820-1857), an American Arctic explorer, *b.* in Philadelphia, Pa. He graduated from the medical school of the University of Pennsylvania, in 1842, then entered the U. S. Navy as a surgeon. After four years of extensive travel he returned home and was assigned by the Government to make a survey of the Gulf of Mexico. In 1850 he joined the first Grinnell Expedition to the Arctic as chief surgeon, which sailed in search of Sir John Franklin. After his return he was again sent out, this time in command of the Advance, on what was known as the second Grinnell Expedition, and was frozen in in latitude 78° 43′ N. Here the ship was abandoned, and with only the loss of one man by an accident, the whole ship's company sledged ten weeks over the ice to Greenland, a distance of 1,300 miles. He wrote "The U. S. Grinnell Expedition in Search of Sir John Franklin—a Personal Narrative," 1852, and "The Second Grinnell Expedition," 1856.

KANGAROO ISLAND, in St. Vincent Gulf, S. Australia, is cut off from Yorke's Peninsula by Investigator Strait. It was discovered by Captain Flinders, in 1802. Its area is 1,700 sq. miles. Pop. 600.

KANGAROOS, see under MARSUPIALS.

KANGRA (32° 5′ N., 76° 16′ E.), town, Punjab, India, damaged by earthquake, 1905. Pop. 5,000. K. district has area *c.* 9980 sq. miles. Pop. *c.* 786,000.

KANKAKEE, a city of Illinois, in Kankakee co., of which it is the county seat. It is on the Illinois Central and other railroads, and on the Kankakee river. It is an important trade center and has manufacturers of horseshoe nails and other commodities. It is an important railroad junction. Its public institutions include Illinois Eastern Insane Hospital, Emergency Hospital, a conservatory of music and a public library. Pop. 1920, 16.753.

KANKER.—(1) (*c.* 20° 20′ N., 81° 20′ E.), native state, Central Provinces, India. Pop. 105,000. (2) (20° 14′ N., 81° 32′ E.) town, K., India. Pop. *c.* 4000.

KANO (11° 59′ N., 8° 19′ E.), walled town, capital of K. province, N. Nigeria; has royal palace; is great trading centre; manufactures leather, cottons, slippers, etc.; occupied by British, 1903. Pop. estimated at 100,000. K. province (*c.* 11° 38′ N., 8° 20′ E.), has area (including Katagum, with which it was united in 1905) of over 30,000 sq. miles. Pop. *c.* 2,500,000.

KANSAS, a central state of U. S. (38° 30′ N., 98° 20′ W.); bounded N. by Nebraska, E. by Missouri, S. by Oklahoma, W. by Colorado. Surface generally consists of undulating prarie, rising from 800 ft. in S. E. to 4,000 ft. in N. W. drained by Kansas and Arkansas and their tributaries, flowing to the Missouri. Principal towns are Kansas City, Topeka (cap.), Wichita, Leavenworth. Climate is healthy, although subject to occasional extremes of both heat and cold. See Map of U. S.

Kansas was originally inhabited by various Ind. tribes, to one of which it owes its name. Greater part was included in Louisiana Purchase in 1803 and it was organized as a territory of U. S. half a century later. Scene of great political struggle between the slavery and emancipation parties for several years, in the course of which occurred hostilities almost amounting to civil war. Kansas was admitted as state to Union in 1861; during Civil War supported Federalist army by sending force consisting of about one-fifth of total population. After close of war great number of settlements sprang up. Administration is carried out by governor assisted by six ministers; legislative authority vested in senate of 40 members and house of representatives of 125 members, elected by popular vote for four and two years respectively; sends to Congress two senators and eight representatives. The chief religious denominations are Methodist, R. C., Baptist. Education is free and obligatory.

Kansas is pre-eminently an agricultural state (irrigation required in W.) and produces large crops of corn, wheat, oats, sorghum, beet, cotton. Live stock is largely raised—horses, cattle, sheep, pigs. Minerals include vast quantities of coal; oil, petroleum, zinc, limestone,

lead, salt, gyspum also found. Industries include meat packing, flour milling, dairying. Railway mileage is 9,386. Area, 82,158 sq. m. (384 sq. m. being water); pop. (1920), 1,769,257.

KANSAS CITY, a city of Kansas, in Wyandotte Co., of which it is the county seat. It is on the Missouri Pacific, the Union Pacific, and the Chicago Great Western railroads, and at the junction of the Missouri and Kansas rivers. The city is opposite Kansas City, Mo., and constitutes practically one city. The two cities together form the second largest livestock and meat packing place in the United States. The city has other large commercial and industrial interests including extensive grain and flour trade, smelting and refining works, iron and steel works, and foundries. It contains the shops of the Missouri Pacific, the Union Pacific, and the Rock Island railroads. There is an excellent system of parks and boulevards. Several bridges connect the city with Kansas City, Mo. The public institutions include the State Institute for the Blind, Kansas City University, Western University, College of Medicine, and two hospitals. Pop. (1920), 101,078.

KANSAS CITY, a city of Missouri, in Jackson Co. It is on the bounday line between Missouri and Kansas, and directly opposite Kansas City, Kansas. It is one of the most important railroad centers of the United States and is on the Chicago and Alton, the Atchison, Topeka and Santa Fe, the Chicago, Great Western, the Chicago, Rock Island and Pacific, the Chicago, Milwaukee and St. Paul, the Union Pacific, and other railroads. Several of these roads use Union Station, one of the largest in the United States. The Missouri River is crossed here by several bridges. There is also commerce on the river from Kansas City to St. Louis. The city is built on three hills. The manufacturing and wholesale districts are chiefly on the first, and are separated from the central business or retail districts by high bluffs. The residential city is on the third on the highest elevation. There is an excellent system of streets of which about 500 miles are paved. There are many handsome public buildings, including Union Station, City Hall, Courthouse, Board of Trade building, Livestock exchange, Y. M. C. A. building, General Hospital, and many handsome business blocks. The city is the seat of many educational institutions, including the University of Missouri, William Jewell College, Park College and Baker University. There is an excellent system of public schools and many special schools. Kansas City is famous for its park and boulevard system which has been laid out with great care and expense. There are over 50 miles of boulevard which connect 2,600 acres of public park within the city limits. The city is the center of a vast agricultural region and it has an extensive business in grain, live stock and meat packing. It is the largest winter wheat market in the world and its grain elevators have a capacity of about 20 million bushels. In the city are over 1,500 factories whose products are valued at about $325,000,000. There is a Federal Reserve Bank, 15 national banks, and many other financial institutions. Kansas City was first settled in 1820 by a company of French fur traders. The town was incorporated in 1850 as the town of Kansas. The name was changed to Kansas City in 1890. Pop. (1920), 324,410.

KANSAS-NEBRASKA BILL, THE. Passed by Congress in 1854 for organizing the territories of Kansas and Nebraska. It was intended as a compromise between the southern extremists who wished to extend slavery, and the abolitionists of the North. It emphasized popular or 'squatter' sovereignty, and repealed the Missouri Compromise of 1820. Its principal feature was 'not to legislate slavery into any territory, or state, nor to exclude it there from, but to leave it to the people to regulate subject to the Constitution.' The bill was passed after a bitter debate, Stephen A. Douglas being its sponsor. The passage of the bill caused a revival of the slavery controversy, broke up the Whig party and led to the organization of the Republican party, and no doubt hastened the Civil War.

KANSAS RIVER (KANS.), is formed in Geary County by the Smoky Hill and the Republican rivers, flows easterly, turning northward at Junction City and finally empties into the Missouri River at Kansas City. Its total length is about 150 miles.

KANSAS, UNIVERSITY OF, a co-educational, state institution in Lawrence, Kans., founded in 1864. In 1921-22 it had a student body of 3,649; of which 2,220 were in the College of Liberal Arts and Sciences; 646 in the Engineering School; 291 in the department of Fine Arts; 169 in the Law department; 109 in the Graduate School, while the balance were distributed among the departments of pharmacy, education, medicine and nursing. The teaching staff numbered 303.

KANSAS WESLEYAN UNIVERSITY, an educational institution founded in Salina, Kans., in 1885. In 1921-22 the

faculty numbered 33 and the students 883. It has a library of 12,500 volumes. The president was then L. B. Bowers, D. D.

KANSK (56° 20′ N., 95° 50′ E.), town, Siberia. Pop. 8,000.

KAN-SUH (36° N., 105° E.), province, China; drained by Hwang-ho. Pop. *c.* 10,000,000.

KANT, IMMANUEL (1724-1804), one of the most important of modern philosophers, and perhaps the greatest of all metaphysicians, born of Scottish descent at Königsberg (E. Prussia), a hotbed of pietism. He was educated at the gymnasium of his birthplace, and subsequently at the university, whither he proceeded in 1740 to study mathematics, theology, and philosophy, the latter chiefly of the Wolffian school, which at that time held sway in Germany. Towards the end of the six years he spent there, he was sorely pressed for money, on account of his father's death; and from 1746-1755 earned a scanty living as private tutor. In 1755, obtaining his degree of doctor of philosophy, he became a docent, *i. e.* a private lecturer under the control of the university, and eleven years later he was appointed a sub-librarian. It was not until 1770 that he succeeded to the coveted professorial chair; and in the new appointment he lectured not only on metaphysics and logic, but also on natural science, geography, anthropology; physics, and mathematics. Meanwhile he had not been idle in the literary field; his first book, *Thoughts on the True Estimate of Living Forces*, was published in 1747, and the *Theory of the Heavens* in 1755. *Dreams of a Visionary*, his first really significant work, appeared in 1766, probably inspired by his reading at that time of Swedenborg. This work has sometimes been regarded as the introduction to his ambitious system of critiques which came later; but perhaps it would be more correct to assign that place to his Latin treatise, *Dissertatia de Mundi Sensibilis* (1770). It was only during his occupation of the chair of philosophy at Königsberg University (1770-97) that he was recognized at all widely as a profound and original thinker. As a lecturer he was successful, although his weak voice, deformity, and slight physique were hardly of service to him in commanding respect and attention. His ultimate fame rests on the writings of the later part of this period, of which the *Critique of Pure Reason* (1781), his best-known work, and the basis of all his subsequent writings, came first. As an introduction to this, he published the *Prolegomena* (1783); a year or so later an explanatory popular version was issued by one of his students; the *Metaphysic of Ethics* (1785), and *Metaphysic of Nature* (1786) appeared, and the critique passed into his second edition in 1787. Meanwhile, Königsberg had become the centre of philosophical activity, and K.'s method had been adopted by nearly all the German universities, not only for philosophy, but also in some instances for combination with Christian ethics. The remaining critiques, *Of Practical Reason* (1788) and *Of Judgment* (1790), complete the list of his most important works. In 1792 his teaching was censored by the Prussian government on account of the anti-Lutheran ideas in his rationalistic thesis, *On Religion within the Limits of Reason alone*, of which the first part had appeared in the *Berlin Journal*, to which he was a regular contributor. Gradually, as time passed, K. showed signs of impaired health and mental vigor, and in 1797 he resigned his chair.

KAOLIN, the name given to any white clay suitable for the manufacture of porcelain. The word is derived from the Chinese *Kau-ling*, the name given to the white, earthy material used in the manufacture of porcelain at King-te-chin, and mined in the Kau-ling Hills. Originally the name 'kaolin' was applied only to those clays containing a high percentage of the mineral *Kaolinite*, a hydrated aluminum silicate, having the formula $H_4A1_2\ Si_2O_9$, but while most china clays approximate, in composition, the formula given above, few of them contain the mineral kaolinite in sufficient quantities to be definitely identified. The kaolin of commerce, therefore, consists of white clay possessing the property of forming a plastic mass when mixed with water, and containing a mixture of hydrated aluminum silicates, with small quantities of free silica, felspar and mica. Clays are of two varieties—residual and sedimentary. Residual clays are formed by the breaking down and decomposition of rocks, and they are found adjacent to the rock masses from which they originated. The breaking down is brought about by water. Sedimentary clays are formed by deposits carried down by rivers from distant points. Kaolin is usually residual clay, and is found in Cornwall and Devon, in England, in France, Bohemia, the United States, South Africa and other parts of the world. To free the clay from grit, it is mixed with water, the grit allowed to settle, and the finer particles floated off. Kaolin, besides being used in the manufacture of china and porcelain, forms the filler for many grades of paper, and is also

employed in the finishing of calico and the coating of paper.

KAPUNDA (34° 20′ S., 139° E.), town, S. Australia. Pop. 2,000.

KAPURTHALA (31° 27′ N., 75° 22′ E.), native state, Punjab, India; area, *c.* 635 sq. miles. Pop. 270,000.

KARA SEA (73° N., 64° E.), part of Arctic Ocean between Novaya Zemlya and N. W. Siberia.

KARACHI, KURRACHEE.—(1) (25° N., 67° 40′ E.), district, Bombay, India; area, *c.* 12,000 sq. miles; produces rice, millet. Pop. 609,000. (2) (24° 53′ N., 66° 57′ E.), town; good harbor; trading and railway centre; exports wheat, cotton. Pop. 152,000.

KARAGEORGE, TSERNI PETROVITCH (*c.* 1752-1817), founder of Serbian independence; stormy youth stained by murder and partricide and life of haidouk (robber chief); chosen leader of revolutionary party, 1804; Turks expelled and Belgrade captured by 1807; Russia sent reinforcements, but made peace with Turkey, 1812; Turks reoccupied Servia, 1813; assassinated; fierce, barbarous leader of genius.

KARA-HISSAR, ICHJE, ISCHA (40° 15′ N., 38° 22′ E.), village, Asia Minor; marble quarries.

KARA-HISSAR SHARKI (40° 15′ N., 38° 22′ E.), town, Asiatic Turkey; alum mines. Pop. *c.* 13,000.

KARAKORUM (1) (46° 58′ N., 102° 12′ E.), ancient capital of Uigur kingdom Mongolia, China; ruins remain. (2) (*c.* 47° 27′ N., 102° 35′ E.), old capital of Mongol kingdom; founded, 1234.

KARA-KUL, GREAT (38° 40′ N., 72° 5′ E.), lake, Ferghana, Russian Turkestan. **KARA-KUL, LITTLE** (44° N., 70° 30′ E.), lake, Ferghana, Turkestan.

KARA-KUM (46° N., 66° E.), desert in Trans-Caspian province of Western Turkestan, between Amu Darya on N. E. and Persia on S. W.; area, 110,000 sq. miles.

KARAMAN (37° 9′ N., 33° 2′ E.), town, Asia Minor. Pop. *c.* 7,000.

KARAMZIN, NIKOLAI MIKHAILOVICH (1765-1826), Russ. historian; imperial historiographer; author of *History of Russian Empire, Letters of a Russian Traveller,* and a number of essays and stories; a master of Russ. prose.

KARATEGHIN (39° N., 71° E.), province of Bokhara, Russ. Central Asia; live stock, fruit, corn. Pop. *c.* 70,000.

KARAULI, KEROWLEE (26° 27′ N., 77° 4′ E.), capital, native state of K., Rajputana, India. Pop. 24,000; of state, 160,000.

KAREZAG (47° 19′ N., 20° 56′ E.), town, Hungary. Pop. 21,000.

KAREN-NI (18° 55′ to 19° 51′ N., 97° 8′ to 97° 50′ E.), region between Siam and Lower Burma, consisting of number of small native states under Brit. control; inhabited by Red Karens and other tribes, said to be diminishing in numbers; produces teak, rice, tin. Pop. *c.* 30,000.

KARIKAL (10° 34′ N., 79° 40′ E.), Fr. possession, Coromandel Coast, India. Pop. 57,000.

KARLI (18° 46′ N., 73° 30′ E.), famous cave-temple and village, Bombay Presidency, India.

KARLSBAD. See CARLSBAD.

KARLSKRONA (56° 9′ N., 15° 39′ E.), port, Sweden. Pop. (1921), 27,055.

KARLSRUHE, cap. of Baden, Germany (49° 1′ N., 8° 24′ E.); founded by Karl, Margrave of Baden (1715); has palace and important picture gallery and academy of art; its polytechnic (1825) first of the kind in Germany; manufactures machinery, hardware, chemicals, carpets. In World War several times bombed by Brit. and Allied airmen. Pop. (1919), 135,952.

KARLSTAD (59° 23′ N., 13° 30′ E.), town, Sweden. Pop. (1921), 19,246.

KARMA. See BUDDHISM.

KARMATHIANS. See CARMATHIANS.

KARNAK, CARNAC (25° 40′ N., 32° 43′ E.), village, Egypt, on Nile, where ancient Thebes stood; site of great Egyptian temple of K. and other ruins; building of great temple is due to many successive kings; especially celebrated is the Great Hall of Columns, remarkable for perspective and fine lotus capitals. On either side of principal temple are smaller temples, from one of which, built by Rameses III., an avenue of sphinxes leads to temple of Luxor.

KARNAL (1) (29° 36′ N., 76° 58′ E.), district, Punjab, India; cotton, sugar, cereals. Pop. 885,000. (2) (29° 42′ N., 77° E.), town. Pop. 23,700.

KAROLYI, MICHAEL, COUNT, Hungarian democratic statesman, of pacifist principles. During World War got into trouble for outspoken condemnation of Ger. ideals of world dominion; was entrusted with abortive Austro-Hungarian

peace overtures to Allies through Switzerland (1917). When Dual Monarchy realized its defeat he was called upon to form a ministry (Nov. 1918). His first task was to conclude peace with General Franchet d'Esperey, commander on the Macedonian frontier (Nov. 8), and later in same month he became provisional president of the Hungarian republic. His endeavors to restore order were frustrated by Bolshevist propaganda, and with the whole government he resigned (March 1919).

KARROO (33° 2′ S., 19° 42′ E.), scrubby tablelands, Cape Province, S. Africa; nearest coast is LITTLE K., while GREAT K., farther inland, leads up to central S. African plateau; clay soil; pasturage; transformed from wilderness into verdant plains after rains.

KARS (40° 36′ N., 43° 9′ E.), fortress and cathedral town, Kars, Transcaucasia; K. was gallantly defended by Turks under Gen. Fenwick Williams against Russians, June to Nov. 1855; taken from Turks by Russians, 1877. Pop. 25,000.

KARS (40° 38′ N., 43° 12′ E.), province, Transcaucasia, Russia; surface on elevated plateau crossed by mountains; area, 7,238 sq. miles. Pop. 492,000.

KARSHI (38° 43′ N., 68° E.), town, Bokhara, W. Turkestan. Pop. *c.* 25,000.

KARUN (31° 10′ N., 48° 30′ E.), river, Persia; has its source in mountains of Bakhtiari; unites with Shat-el-Arab at Mohammerah, by the Hafar Canal; open to foreign navigation as far as Ahvaz.

KARWAR (14° 48′ N., 74° 16′ E.), port, Bombay, India. Pop. 17,000.

KASAI, CASSAI (3° 9′ S., 16° 15′ E.), river, Africa; source in Portug. W. Africa, which it separates from Belg. Congo; then flowing N. W. unites with Kwango and joins Congo near Ngato.

KASHAN (33° 50′ N., 51° 47′ E.), province, Persia. Pop. over 30,000.

KASBEK (42° 41′ N., 44° 29′ E.), mountain peak, Caucasus; *c.* 16,550 ft.

KASHGAR (39° 20′ N., 76° 4′ E.), town, Eastern Turkestan, on trade route between India, China, and Russia; divided by Kizil River into new and old towns, Yangi Shahr and Kuhna Shahr, both fortified and surrounded by clay walls. Yangi Shahr contains gov.'s palace; Kuhna Shahr contains Hazrat Afak's shrine, and mosque built by Yakub Beg; manufactures silks, cottons, carpets, saddlery; in Chinese hands since 1758, but under Russ. influence. Pop. estimated at 60,000.

KASHKAR, a species of sheep found in Central Asia. The male has large circular horns, while the horns of the female resemble those of the goat.

KASHMIR, CASHMERE (*c.* 34° N., 74° 50′ E.), native state, N. W. India; area, 80,900 sq. miles. Surface consists of mountains and rich valleys, the latter 5,000 ft. above sea-level; forms basin of Upper Indus and is crossed by the Jhelum, which widens into several lakes, and its tributaries. Chief town is Srinagar. K. has fine climate and is much visited as health-resort. K. was inhabited in early times by various Aryan tribes; Buddhism introduced in III. cent. B. C., eventually superseded by Hinduism; came under Muhammadan control in XIII. cent.; invaded by Mongols under Timur, XIV. cent.; belonged to Afghans in XVIII. cent. and to Sikhs in early XIX. cent. After Sikh defeat by British in 1846 K. was sold by Brit. government to Golab Singh, prince of Jammu, who was acknowledged as independent ruler.

Soil is fertile, producing rice, maize, and other cereals, fruits and vegetables. Silkworms are reared. Principal industries are silk-weaving, shawl and carpet manufacture, metal work. Inhabitants belong chiefly to Muhammadan faith, but there are considerable numbers of Hindus, Buddhists, and Sikhs. Pop. (1921), 3,322,080.

KASHMIRI, language commonly spoken in Kashmir by over 1,000,000 people. It is an Indo-European or Aryan language forming a small subgroup by itself with Shinā, Khovvār, Kāfir, and Kōhistan. These are mere unliterary dialects, but K. has a lit. of its own. It is an old language, the first record of it being undoubted K. words in a Sanskrit MSS. of the XII. cent. A. D. Its lit. is small in bulk, and continuous to the present day. The language appears to have altered very little since the first extant work writeen wholly in K., the *Lallā-vākyā*, a philosophical poem of disputed authorship.

KASHUBES, a Slav race inhabiting the shores of the Baltic.

KASIMOV (54° 53′ N., 41° 29′ E.), town, Russia. Pop. 14,000.

KASSALA (15° 30′ N., 36° 10′ E.), fortified town, Sudan, Egypt; important centre of trade. Pop. *c.* 19,000.

KASSITES, a non-Semitic people among the ancient Babylonians, in whom they were ultimately merged.

KASTAMUNI, KASTAMBŪL (41° 23′ N., 33° 43′ E.), capital, K. vilayet, Turkey in Asia. Pop. *c.* 16,500. K. vilayet has area 19,570 sq. miles. Pop. 961,200.

KASTORIA (40° 34′ N., 21° 19′ E.), town, Turkey in Europe. Pop. *c.* 10,000.

KATANGA (*c.* 10° 52′ S., 27° 20′ E.), region, Belgian Congo, N. of Rhodesia; rich in copper; connected by rail with Cape Town, and objective of Benguella railway. Pop. *c.* 1,000,000.

KATHA (24° 5′ N., 96° 7′ E.), region, Upper Burma; chief town, KATHA; area, *c.* 7,000 sq. miles. Pop. 180,000.

KATHIAWAR, KATTYWAR (21° 40′ N., 71° E.), peninsula, W. coast, India, between Gulf of Cambay and Gulf of Cutch; area, 20,559 sq. miles; produces cotton. Pop. *c.* 2,500,000.

KATMAI, MT. A volcano in the Aleutian Range of the Alaska Peninsular, located near the shores of Shelikof Strait, opposite Kodiak Island, longitude 155° 30′ W., latitude 58° N. Height 7,500 feet. Until 1912, the volcano was believed to be extinct, but on 6th June in that year there was a violent eruption, in the course of which the top of the mountain was blown off, and Kodiak Island was covered with volcanic dust to a depth of twelve inches, while the neighboring districts were plunged in darkness for two-and-a-half days. In the summer of 1916, under the auspices of the National Geographic Society, the mountain and crater were explored and photographed by Robert P. Grigge, Lucius G. Folson and Donovan Church. Information of much interest was obtained by the expedition. The explorers found various subsidiary craters, but according to their report the main crater is one of the largest in the world, being many miles in diameter and thousands of feet deep. At the bottom of the crater, they observed a blue-green lake, "simmering and spluttering". One of their most surprising discoveries was that part of the crater wall consisted of a huge glacier, blown in two, and not yet melted by the intense heat from the crater. Other parts of the crater wall consisted of brilliant-colored igneous rock.

KATMANDU (27° 35′ N., 85° 21′ E.), town, Nepal, India. Pop. *c.* 51,000.

KATO, TOMOSAURO, BARON, (-1923) Japanese Prime Minister. He served with distinction in the navy and rose to the rank of admiral. In 1921 he was Minister of Marine. He was the Japanese representative at the Conference on the Limitation of Armaments at Washington. In 1922 he was appointed Prime Minister. His attitude toward the United States was friendly. He died in August, 1923.

KATRINE, LOCH (56° 14′ N., 4° 27′ W.), lake, Perthshire, Scotland; scene of Scott's *Lady of the Lake.*

KATSURA TARA, PRINCE (1847-1913), a Japanese soldier and statesman; *b.* in the province of Choshiu. After seeing service in the Civil War of the Restoration, his military talent was so conspicuous that he was sent, in 1870, to study in Germany at his country's expense; from 1875-78, he was military attaché at the Berlin Embassy. In 1884, he became vice-minister of war, and served with distinction in the campaign of 1894-95, receiving the title of viscount. After being Minister of War from 1898-1901, he became Premier, an office which he held for four years, a record time in Japan. For his services he was raised to the rank of count, in 1902, and marquess, in 1905, when King Edward made him a K.C.-M.G.

KATTOWITZ (50° 16′ N., 19° 2′ E.), town, Poland. Pop. 44,000.

KATYDID, a species of grasshopper, pale green in color, and about an inch in length. It is found in many parts of the United States, and is so called from the sound of its note.

KAUAI, see HAWAIIAN ISLANDS.

KAUFFMANN, ANGELICA (1741-1807), Swiss painter; worked first in Italy, afterwards in London, where she attained fame for her classic and mythological pictures and her portraits. She was a friend of Reynolds and Goldsmith, and was one of the earliest of the Royal Academicians.

KAUFFMAN, REGINALD WRIGHT (1877), author. Born in Columbia, Pennsylvania. 1893-1896 educated in school in Concord. 1896-1897 special student at Harvard. 1897-1898 reporter, editorial and special writer for Philadelphia Press. 1904-1907 associate editor of magazine. 1909 managing editor of magazine. 1914-1915 war correspondent in Europe. 1916 enlisted for Mexican Service in (Roosevelt Division). 1917 enlisted for service in France. Author of: *Jarvis of Harvard,* 1901; *The Things That Are Caesar's,* 1902; *The Chasm,* 1903; *Miss Frances Baird, Dectective,* 1906; *The Bachelor's Guide to Matrimony,* 1907; *What is Socialism,* 1910; *My Heart and Stephanie,* 1910;

The House of Bondage, 1910; *The Girl That Goes Wrong*, 1911; *The Way of Peace*, 1911; *The Sentence of Silence*, 1913; *The Latter Day Saints*, (with Ruth Wright Kauffman), 1917; *The Azure Rose*, 1918; *Our Navy at Work*, 1918; *Victorious*, 1919.

KANKAUNA, a city of Wisconsin in Outagamie County; on Fox River; paper and pulp mills; Pop. 1920, 5951.

KAULBACH, WILHELM VON (1805-74), Ger. painter; director of the Academy, Munich (1849). His pictures are mostly of a grandiose, realistic style. He illustrated works of Shakespeare, Goethe, Klopstock, and Wieland, and painted some portraits.

KAUNITZ-RIETBURG, WENZEL ANTON, PRINCE VON (1711-94), Austrian statesman; ambassador in Rome, Florence, Turin, and afterwards in Austrian Netherlands; member of Peace Congress at Aix, 1748; ambassador in Paris, 1750; Chancellor 1753; negotiated alliances with France and Turkey; former resulted in Seven Years War.

KAVADH, name of two kings of Persia.—KAVADH I. (449-531) reigned 488-531; fought against Rom. Empire under Anastasius and Justin I.—KAVADH II. reigned some months, 628.

KAVALA, CAVALLA (40° 56′ N., 24° 23′ E.), port, Turkey-in-Europe; Rom. aqueduct; tobacco exported. Pop. *c.* 5,000.

KAVANAGH, JULIA (1824-1877), a British novelist; *b.* at Thurles, co. Tipperary. She spent several years of her life in Normandy and Paris, and began her literary career in London, in 1844, the first work to attrack notice being *Madeleine, a Tale of Auvergne.* She also wrote *Nathalie*; *French Women of Letters*; *English Women of Letters*; *A Winter in the Two Sicilies.*

KAVIRONDO, two immigrant races, Bantu and Nilotic, inhabiting the valley of the Nzoia River and the N. E. coast of Victoria Nyanza, Brit. E. Africa; fine physique; independent, peaceful, and brave; honest, and of strict sexual morality; unchastity was formerly a capital offence amongst the K.; agricultural, both men and women working in the fields, and cultivating sorghum, maize, tobacco, and hemp; increasing in numbers, owing to their clean living; under Brit. protection.

KAWARDHA (22° N., 81° 15′ E.), native state, Central Provinces, India. Pop. *c.* 60,000.

KAYE-SMITH, SHEILA, British author. Her first work of fiction, *The Tramping Methodist*, appeared in 1908. Her later books include *The Challenge to Sirius*, 1917; *Little England*, 1918; *The Four Roads*, 1919; *Green Apple Harvest*, *Sussex Gorse*, and *Tamarisk Town*, 1920, and *Joanna Godden*, 1922. She also became known for her poetry and short stories in current periodicals. Rural life in Sussex, her place of residence, provides the theme and background for most of her writings.

KAZAN. (1) Government in Russia, crossed by Volga; rye, oats; sheep rearing and bee keeping; large forests. Pop. *c.* 3,000,000. (2) Cap. of above (55° 48′ N., 49° 6′ E.); has fortress containing governor's castle, arsenal, monastery, cathedral; Gr. archi-episcopal see; univ. established in 1804; soap, candles, slippers; centre of trade with Siberia, Bokhara, Persia. Pop. *c.* 200,000.

KAZERUN (29° 35′ N., 51° 47′ E.), town, Persia. Pop. *c.* 8,000. Kazerun district has pop. *c.* 15,000.

KAZVIN (36° 11′ N., 49° 56′ E.), province and town, Persia; produces grain. Pop. *c.* 45,000.

KEAN, CHARLES JOHN (1811?-68), an actor, the second *s.* of Edmund K., appeared at the age of 16 as 'Young Norval' in Home's *Douglas*, at Drury Lane. The favorable impression he made secured him an engagement at the Haymarket, where he was successful as 'Hamlet.' Among his other triumphs were 'Richard III.,' 'Sir Giles Overreach,' and 'Louis XI.' Many of the parts he created were, however, subsequently better played by Sir Henry Irving. He went more than once to the United States, where he was heartily welcomed, and where he made much money. He married, in 1842, Ellen Tree. There is a biography by J. W. Cole, 1859.

KEAN, EDMUND (1787-1833), Eng. actor; *b.* London; *s.* of Nance Carey, actress; father unknown; after playing in various touring companies, made first appearance in London at Drury Lane as Shylock, 1814, which gained him popular favor. His misconduct in England drove him to America (1825-26), but he regained popularity on his return, acted last in Othello, March 1833.

KEARNEY, a city of Nebraska, in Buffalo Co., of which it is the county seat. It is on the Union Pacific and Burlington railroads, and on a canal which extends from the Platte River from which water power is furnished for manufacturing. It is an important trade center for a large farming and stock raising area. Its industries in

clude cotton mills, flour mills, and machine shops. It is the seat of the Western State Normal School and State Industrial School for Boys. Pop. (1920), 7,702.

KEARNY, a city of New Jersey, in Hudson Co. It is on the Erie railroad and on the Passaic river. Although it is chiefly a residential community it has many important industries, including the manufacture of linoleum, thread, brass goods, fertilizers, lamps, buttons, etc. It is the site of the State Soldiers' Home, Roman Catholic Protectorate, a hospital and an orphan asylum. Pop. (1920), 26,734.

KEARNEY, DENIS (1847-1907), Californian labor agitator; *b.* Oakmont, Ireland. He settled in San Francisco in 1872 after a youth spent at sea and became a foreman of stevedores. Later he conducted a draying business and led a labor movement against capital and the admission of Chinese labor. His attacks upon wealth brought him thousands of adherents, whom he dominated, and resulted in his supporters packing a constitutional convention in 1879, when a new State constitution was adopted that favored labor and was inimical to property interests. The following year he attempted to extend his influence to the East but the violent speeches he made in the chief cities of that section failed to stir Eastern labor and he returned to California. Subsequently his influence among labor gradually waned and 'Kearneyism' lapsed into obscurity. Bryce dealt with the fleeting influence of Kearney's crusade in his *American Commonwealth.*

KEARNY, PHILIP (1815-1862), major general; *b.* New York; *d.* Chantilly, Va. He was a nephew of General Stephen W. Kearny. Graduating from Columbia in 1833, he learned law and in 1837 entered the army as a cavalry officer. Two years later he was sent to France to study the cavalry service there and entered the French army on a leave of absence, serving with distinction in the war with Algeria. In the Mexican War of 1846 he commanded General Scott's bodyguard and led a mounted charge into Mexico City that caused the loss of an arm. In 1859 he was again fighting for France, this time in the war with Italy, and received the cross of the Legion of Honor for bravery. The Civil War brought him back into the American army as a brigadier-general in command of cavalry in the Army of the Potomac. He made a noteworthy record in the Peninsula campaign and in the second battle of Bull Run, and was killed while reconnoitering at Chantilly.

KEARNY, STEPHEN WATTS (1794-1848), major general; *b.* Newark, N. J. He took part in the War of 1812 as a lieutenant and was captured by the British. The Mexican War of 1846 made him prominent as commander of the Army of the West that conquered New Mexico. In 1847 he was ordered to enter California, organize a civil government there, and exercise the powers of governor, but shortly afterward was transferred to Mexico. There he acted as first as military governor of Vera Cruz, and then of Mexico City, where he contracted a fever that caused his death.

KEARSARGE, the name of two mountains in New Hampshire; one 3,250, and the other 2,950 feet in height. The name was given to one of the famous warships of the Civil War, which defeated the Confederate privateer *Alabama,* off the coast of France, June 10, 1864. The name is borne by one of the battleships of the present American Navy.

KEATS, JOHN (1795-1821), Eng. poet; *s.* of livery-stable keeper; apprenticed to surgeon, 1810; became dresser at Guy's Hospital, 1816; abandoned med. for lit.; first poems pub., 1817; *Endymion* appeared, 1818; *Lamia, Hyperion,* and other poems, 1820; attacked by various journals, notably *Quarterly Review*; unfortunate in his love; driven from England by consumption; *d.* in Rome. K.'s poetry is immature, and much of it is mawkish in its sentimentality, but such poems as *La Belle Dame sans Merci, The Ode on a Grecian Urn,* and his sonnets are unsurpassable.

KEBLE, JOHN (1792-1866), Eng. priest and poet; *b.* Fairford; ed. at home and Corpus Christi College, Oxford, where he had a brilliant career; ordained priest, 1816; elected tutor of Corpus Christi, 1818; retired, 1823; published *Christian Year,* a book of meditations in verse for holy days, 1827; prof. of Poetry at Oxford, 1831-41; founder of Tractarian movement, which tried to produce a spiritual and modern awakening within the Eng. Church; closely associated with Newman and Pusey, with whom he issued *Tracts for the Times.*

KEDGE, a small anchor used to steady a ship and keep her clear from her bower anchor while riding the harbor or river.

KECSKEMET (46° 54′ N., 19° 44′ E.), town, Hungary; manufactures soap and leather. Pop. (1920), 72,768.

KEELING ISLANDS, Cocos Islands (*c.* 12° 8′ S., 96° 50′ E.), about twenty small coral islands, Indian Ocean; under Brit. protection since 1857; produce cocoa-nuts, copra; visited by Darwin, 1836; cable station.

KEEN, WILLIAM WILLIAMS (1837), surgeon; b. Philadelphia, Pa. He served as a surgeon of the Union army in the Civil War after graduating from the Jefferson Medical College in 1862. Later he studied in Europe, lectured on pathological anatomy at his alma mater, headed (1866-75) the Philadelphia School of Anatomy, and became professor of artistic anatomy at the Pennsylvania Academy of Fine Arts (1875-90) of surgery at the Women's Medical College (1884-89), and also professor of surgery at Jefferson Medical College until 1907. A number of honorary degrees were conferred upon him, including the LL. D. of Edinburgh University, and he became president of leading American medical bodies as well as a distinguished member of similar societies abroad. He wrote extensively on medical subjects and edited *Gray's Anatomy*, *American Textbook of Surgery*, and *Keen's System of Surgery*.

KEENE, a city of New Hampshire, in Cheshire Co., of which it is the county seat. It is on the Boston and Maine railroad, and on the Ashuelot river. It is the center of trade for an important agricultural and manufacturing region. It contains railroad repair shops and plants for the manufacture of woolen and flannel goods, machinery, woodenware, etc. It has a Unitarian Invalids' Home and a hospital. Pop. (1920), 11,210.

KEENE, CHARLES SAMUEL (1823-91), Eng. black-and-white artist; chiefly celebrated by his drawings for *Punch*, to which he contributed from 1851 till near his death.

KEENE, LAURA (1820-1873), actress; b. England; d. Montclair, N. J. Her real name was Mary Moss. She visited the United States in 1852 as an actress of repute, especially in the role of Pauline in the *Lady of Lyons*, and appeared in New York on her way to Australia. She returned to that city on completing her tour, thereafter becoming identified with the American stage. In 1855 she leased the Olympic, which then was known as 'Laura Keene's Theatre', and in 1858 made a conspicuous success in *Our American Cousin*, with Joseph Jefferson and E. A. Sothern in the cast, the latter as Lord Dundreary. It was this play President Lincoln saw at Ford's Theatre, Washington, D. C., when he was assassinated. She was twice married, first to H. W. Taylor in 1847, and to J. Lutz in 1857.

KEEK. See CASTLE.

KEEWATIN (c. 67° 45′ to 50° 30′ N., 85° to 100° W.), district, Canada, between Hudson Bay on E. and Mackenzie, Athabasca, Saskatchewan, and Manitoba on W. The portion south of 60° N. was in 1912 divided between Manitoba and Ontario.

KEF (36° 8′ N., 8° 44′ E.), fortified town, Tunisia, N. Africa. Pop. c. 6,000.

KEI ISLANDS, archipelago, Dutch E. Indies; include GREAT K. (5° 30′ S., 133° E.), and LITTLE K. (5° 30′ S., 132° 44′ E.). Pop. c. 23,500.

KEIGHLEY (53° 52′ N., 1° 55′ W.), town, W. Yorkshire, England. Pop. (1921), 41,942.

KEITH, FRANCIS EDWARD JAMES (1696-1758), Scot. field-marshal in Pruss. service; slain in the Seven Years War; noted for valor.

KEITH, VISCOUNT, GEORGE KEITH ELPHINSTONE (1746-1823), Brit. admiral; defeated French, 1793; shared in reduction of Cape of Good Hope, 1795, and defeated Dutch in Saldanha Bay, 1796; suppressed mutiny at Nore, 1797; captured Genoa, 1800; naval commander in Egypt, 1801.

KELLAND, CLARENCE BUDINGTON (1881), Author b. Portland, Michigan. Bachelor of Laws, 1902, Detroit College of Law. 1903-1907, reporter, political editor and Sunday editor; 1907-1915, lecturer at University of Michigan on juvenile literature and writing as a profession. Author of: *Mark Tidd*, 1913; *Mark Tidd in the Backwoods*, 1914; *American Boy's Workshop*, 1914; *Pieces of Silver*, 1914; *Mark Tidd in Business*, 1915; *The Hidden Spring*, 1915; *Into His Own*, 1915; *Mark Tidd's Citadel*, 1916; *Sudden Jim*, 1916; *The Source*, 1917; *The Little Moment of Happiness*, 1919; *Conflict*, 1921 (which was made into a motion picture); *Contraband*, 1922.

KELLER, ARTHUR IGNATIUS (1867), Artist, Illustrator. Pupil of National Academy of Design. Awarded 1st class medal, National Academy; gold medal, Philadelphia Art Club; Evans water color prize, 1902; 1st Hallgarten composition prize; 1900 silver medal at Paris Exposition; gold and silver medals, St. Louis Exposition, 1904; gold medal, San Francisco, 1915. Among his pictures are *The Sisters*, *The Finishing Touches*, *Lead Kindly Light*, *At Mass* (bought by Munich Academy). Books illustrated, *The Legend of Sleepy Hollow*, Irving; *Her Letter*, *Bret Harte*, *Jerome—A Poor Man*, *The Virginian*, *The First American*, *George Washington*; *Bret Harte's Stories*, *The Law of the Land*.

KELLER, GOTTFRIED (1819-90), Ger. novelist and poet; wrote excellent short stories (*Die Leute von Seldwyla*, etc.), *Der Grune Heinrich* (novel), *Neuere Gedichte* (lyric poems), etc.

KELLER HELEN ADAMS (1880) an American writer, *b.* in Tuscumbia, Ala. As the result of an illness at the age of 19 months, she became deaf and blind, and began her education under the auspices of Miss Anne Mansfield (Mrs. John A. Macy). In spite of her handicaps she entered Radcliffe College and graduated, in 1904. It was during this period that she wrote her first book, '*The Story of My Life*', 1902, a record of her own experiences, which made a profound impression on the educated public and at once made her a prominent figure. To a large number of people she stands as the living incarnation of hope and optimism under handicaps that seem insuperable. Without the sense of sight or hearing, she has not only been able to observe the social environment about her, but to formulate out of these observations judgments and opinions as soundly as any person possessed of an intelligent mind. For many years Miss Keller was unable to speak, but under the instruction of C. A. White, of the New England Conservatory of Music, she acquired such proficiency in her powers of verbal expression that she was able to deliver public lectures. She has written many articles for papers and magazines and, in book form, '*The World I Live In*', 1908; '*The Song of the Stone Wall*', 1910; and '*Out of the Dark*', 1913.

KELLERMANN FRANÇOIS CHRISTOPHE DE, Duke of Valmy, 1735-1820, supported Revolution; defeated Prussians at Valmy, 1792; marshal of France, 1803; duke, 1808. Francois Etienne, Duke of Valmy, 1770-1835, his S.; won battle of Marengo, 1800, and further distinguished himself at Austerlitz, during Peninsular War, and at Quatre Bras.

KELLEY, FLORENCE (1859-), author. Born in Philadelphia, Pennsylvania. 1882 graduated from Cornell, 1894 Bachelor of Laws, Northwestern University. 1893-1897 state inspector of factories for Illinois. American editor of Berlin paper. 1897-1898. 1917-1918 secretary of United States Board of Control of Labor Standards for Army clothing. Author of *Some Ethical Gains Through Legislation*, 1905; *Modern Industry*, 1913. Edited Edmond Kelly's *Twentieth Century Socialism*, 1910.

KELLOGG, CLARA LOUISE (1842-1916), prima donna; *b.* Sumterville, N. C. She studied singing in New York and first appeared in 1860 at Pittsburgh as a concert vocalist. The next year she sang as Gilda in Rigoletto in the Academy of Music, New York, and two years later as Marguerite in Faust. Her success in this role at the age of twenty was repeated in subsequent enactments, notably at Her Majesty's Theatre, London, where she appeared in 1867. She had great histrionic talent as well as an enthralling soprano voice, and was equally effective in concert and oratorio work. She became well known abroad, where she frequently sang before royalty. In 1887 she married Carl Strakosch and retired from the stage shortly afterwards. In 1913 appeared her *Memoirs of an American Prima Donna*.

KELLOGG, FRANK BILLINGS (1856), lawyer; *b.* Potsdam, N. Y. His family later settled in Minnesota, where he received a primary education and studied for the bar. He was admitted in 1877 and became city attorney of Rochester, Minn., and county attorney of Olmstead County. In 1887 he established a practice in St. Paul as a member of the firm of Davis, Kellogg and Severance, and served as general counsel for several railroad and mining interests. He became of note during the Roosevelt administration as chief counsel for the government in its anti-trust suit against the Standard Oil Company, and in contesting the Union Pacific and Southern Pacific merger. In 1916 he was elected U. S. Senator from Minnesota for the 1917-23 term, and at its expiration was defeated for re-election. He was appointed Ambassador to Great Britain in Oct., 1923.

KELLS (53° 43′ N., 6° 53′ W.), town, Meath, Ireland; where illuminated Book of K. was prepared in X. cent.

KELLY, FLORENCE FINCH (1858), author. Born in Girard, Illinois. Graduated at University of Kansas, 1881. Has been on various newspapers in Boston, Lowell, Fall River, Troy, New York, Chicago, Los Angeles, and San Francisco. In 1905 visited Australia and New Zealand to study economic and social legislation. Author of: *With Hoops of Steel*, 1900; *The Delafield Affair*, 1909; *Rhoda of the Underground*, 1909; *Emerson's Wife*, and *Other Western Stories*, 1911; *Fate of Felix Brand*, 1913; *What America Did*, 1919; *The Dixons*, 1921. Writes economic, literary and artistic subjects for magazines.

KELLY, ROBERT LINCOLN (1865), College President. Born in Illinois. Bachelor of Philosophy, Earlham College, 1888. Awarded fellowship in phil-

osophy, 1900-1902. 1888-1890 superintendent of schools, Indiana. 1890-1892 principal of seminary, Michigan. 1892-1898 Indiana. 1898-1900 practical psychologist, Chicago Physiological School. 1898-1900 in charge phychophysical measurements, Chicago. 1900-1901 acting president of Penn College. Dean 1901-1903. President 1903-1917 Earlham College. Minister Congregational Church. Chevalier of the Legion of Honor, France. Wrote for magazines. Lecturer. 1914-1915 president of Association of American Colleges. Trustee American University Union in Europe.

KELMAN, JOHN (1864), clergyman. Born in Scotland. Educated in Royal High School, University and New College, Edinburgh, Ormond College, Australia. Doctor of Divinity, Yale, 1917, Princeton, 1921. In 1890-1891 assistant at Queen's Cross United Free Church. 1891 ordained Presbyterian Minister. 1891-1897 pastor of Peterculter United Free Church. 1897-1907 New North United Free Church. Author of: *The Holy Land*, 1901; *The Faith of Robert Louis Stevenson*, 1903; *From Damascus to Palmyra*, 1906; *Salted with Fire*; *The Courts of the Temple*; *The Road*—A Study of John Bunyan's *Pilgrim's Progress*, (2 volumes) 1912-1913; *Foundations of Faith*, 1921.

KELP, ash of burnt seaweed; yields iodine, potassium chloride, paraffin oil, naptha, ammonium sulphate.

KELTIE, Sir John Scott (1840-), Brit. geographer; librarian (1885-92) and secretary (1892-5) of Royal Geographical Soc.; ed. (jointly) *Geographjal Journal* (1915-17); president of Geographical Section of Brit. Association (1897). Since 1880 he has ed. *The Statesman's Year Book*, and is the author of *History of Scottish Highlands and Clans*, *Applied Geography*, *The Partion of Africa*, *The History of Geography* (with O. J. R. Howarth), etc.

KELVIN, (William Thomson), Baron (1824-1907), most eminent physicist of his time; *b.* Belfast; educated Glasgow and Cambridge; second wrangler and Smith's prizeman; studied for a year at Paris under Regnault; at twenty-two was appointed prof. of natural philosophy, Glasgow Univ., a post he held for fifty-three years. His work covered every branch of physical science, and he pub. over 300 original papers; did valuable work in thermo-dynamics; made submarine telegraphy a possibility; invented practically all the instruments at present used by electrical engineers for measurements; invented sounding apparatus, pressure gauge, tide gauge, tide-predictor, and made great improvements in mariner's compass. He was honored by numerous learned societies; was knighted (1866); president, Royal Soc. (1890); peer (1892); received Grand Cross Royal Victorian Order (1896).

KEMBLE, Eng. theatrical family. John Philip (1757-1823), first London appearance was as Hamlet in Drury Lane (1783); leading tragedian of his day. His bro. Charles (1775-1854) succeeded best in second parts when John played first, *e. g.* Laertes, Cassio, Macduff. Frances Anne, Fanny (1809-93), dau. of Charles, noted for her rendering of tragic parts and her Shakespearean readings. Her sister Adelaide (1814-79) was a distinguished operatic performer and author of some tales.

KEMBLE, JOHN MITCHELL (1807-57), Eng. philologist; *s.* of Charles K., the actor; licenser of plays; pub. *Beowulf* with trans. (1837), O. E. charters, 6 vols (1839-48), *History of Saxsons in England* (1849).

KEMMEL HILL, isolated height, W. Flanders (50° 46′ N., 2° 47′ E.), N. of Ypres; scene of violent struggle during last phase of World War; captured by Germans (April 1918), regained in Sept. 1918.

KEMP, HARRY HIBBARD (1883-), an American author, *b.* at Youngstown, O., *s.* of Wilbert Elijah and Ida Hibbard Kemp. He was educated at the University of Kansas. He traveled all over North America as a tramp and made a trip around the world starting with 2 cents. Author: *Judas* (4-act play), 1910; *The Cry of Youth* (poems), 1914; *The Thresher's Wife* (poems), 1914; *The Passing God* (poems), 1919; *John Gregory* (novel), 1922, and wrote a poetic translation of *El Burlador de Seville*, (by Tellez), under the title of *The Love Rogue* in 1922.

KEMPE, JOHN (*c.* 1380-1454), bp. of Chichester, then London, 1421; chancellor and abp. of York, 1426; cardinal 1439; abp. of Canterbury, 1452.

KEMPIS, THOMAS Á (1379-1471), religious writer; *b.* Kempen, near Cologne; joined *Brothers of Common Life*, became a priest, 1413, and lived in convent till death. Most famous work is his *Imitation* (*of Christ*), which has been translated into nearly every language.

KEMPTEN (47° 43′ N., 10° 18′ E.), town, Bavaria, Germany; site of ancient abbey. Pop. 20,000.

KEN (25° 35′ N., 80° 17′ E.), affluent of river Jumna, N. India.

KEN, THOMAS (1637-1711), Eng. ecclesiastic; ed. Winchester and Oxford; ordained, 1662; prebendary of Winchester, 1672; bp. of Bath and Wells, 1684; one of bp's who resisted James II.'s Declaration of Indulgence, 1688; refused to take oath to William III.; deposed, 1691; author of well-known hymns.

KENA, Keneh (26° 11′ N., 32° 45′ E.), town, Upper Egypt; manufactures pottery, and has trade in grain and dates with Arabia. Pop. 20,000.

KENDAL (54° 19′ N., 2° 46′ W.), town, Westmoreland, England; has old Gothic church and ruined castle where Catharine Parr was born; manufactures heavy woolens, paper, leather; near are traces of Rom. occupation. Pop. (1921), 14,149.

KENDRICK, JOHN BENJAMIN (1857), U. S. Senator and rancher; *b.* Cherokee County, Texas. He received a public-school education and in 1885 became a cattleman in Northern Wyoming and Montana, subsequently acquiring extensive agricultural interests and owning one of the largest range ranches in the West. From 1910 to 1914 he was a member of the Wyoming Senate and was elected Democratic governor of the State for the 1915-19 term. In 1917 he resigned that office following his election to the U. S. Senate for the 1917-23 term, and in 1922 he was re-elected for the succeeding term.

KENESAW MOUNTAIN, an elevation in Georgia, 25 miles north of Atlanta. It is famous for being the site of a battle between the Federal troops under General Sherman and the Confederate troops under General Johnston, which took place June, 1864, and resulted in the defeat of Sherman with a loss of about 3,000 men.

KENG-TUNG (*c.* 21° 7′ N., 99° 51′ E.), Shan state, Burma, Asia; area, *c.* 12,000 sq. miles; surface generally mountainous; drained by affluents of Salwen and Mekong. Chief town is K.-T. (21° 23′ N., 99° 40′ E.). Pop. 5,800. Region produces rice, sugar, cotton, opium, teak, pottery. Pop. *c.* 192,000.

KENILWORTH (52° 22′ N., 1° 35′ W.), town, Warwickshire, England; contains beautiful ruined castle, given to Leicester by Queen Elizabeth, and destroyed by Roundheads. Pop. 6,000.

KENITES, ancient Palestinian folk, probably of Midianite stock.

KENMORE (56° 35′ N., 4° W.), village, Perthshire, Scotland.

KENMURE, WILLIAM GORDON, 6th VISCOUNT, Jacobite, executed for complicity in rebellion, 1716; the title was then attained; restored, 1824; dormant, 1847.

KENNAN, GEORGE (1845), traveller and journalist; *b.* Norwalk, Ohio. He studied telegraphy and in 1865 began an extensive acquaintance with Russia by visiting Siberia to superintend the laying of telegraph lines. His subsequent visits to Russia embraced the exploration of the mountains of Eastern Caucasus and Daghestan, an investigation of the Russian Exile System in the course of which he travelled 15,000 miles; an attempt to visit Count Tolstoy, entailing his arrest and deportation by the Russian authorities; and reporting the Russo-Japanese war of 1904, when he witnessed the siege of Port Arthur. He travelled also in Japan, China, Manchuria and Korea, and lectured and wrote extensively for periodicals upon his experiences. He translated General Kuropatkin's *History of the Japanese War.* His other writings include records of other journalistic work.

KENNEBEC RIVER, a river of Maine, which rises in Moosehead Lake, in the eastern part of the State, and passing Augusta, runs south into the Atlantic Ocean. Its total length is over 150 miles and it is navigable for large vessels as far as Bath, 12 miles from the sea, and for steamers, as far as Augusta. It furnishes abundant water power for the cities along its banks. Formerly much ice was cut on the river in winter, but in recent years this industry has diminished.

KENNEDY, CHARLES RANN (1871), a dramatist, *b.* at Derby, England, *s.* of Edmund Hall and Annie Leng Fawcett Kennedy. He was mostly self educated. After being an office boy for three years he was a writer and lecturer from 1887-97, and for the next eight years, in addition to writing short stories, miscellaneous articles and poems, was in turn, an actor, press agent and theatrical business manager after which he was mainly engaged in dramatic writing. Author (plays): *The Servant in the House,* 1908; *The Terrible Meek,* 1911; *The Necessary Evil,* 1913; *The Idol-Breaker,* 1914; *The Rib of Man,* 1916; *The Army with Banners,* 1917 and *The Fool from the Hills,* 1919.

KENNEDY, JOHN PENDLETON (1795-1870), an American statesman and author, *b.* in Baltimore. He served during the War of 1812 and in 1820 was elected to the Maryland Legislature. He was three times elected to the House of Representatives. In 1852 he became

Secretary of the Navy. He published several novels, the best known of which are *Swallow Barn and Horseshoe Robinson.* He also wrote a *Life of William Wirt.*

KENNETH I., Mac Alpin (*d. c.* 860), Scot. king; defeated Picts; frequently invaded Northumbria. Kenneth II. (*d.* 995) led two expeditions into Northumbria; killed by his own followers.

KENORA (49° 50′ N., 94° 30′ W.), town, Ontario, Canada; flour-mills, saw-mills, gold. Pop. 5,400.

KENOSHA, a city of Wisconsin, in Kenosha, Co., of which it is the county seat. It is on the Chicago and Northwestern railroad, and on Lake Michigan. It is a favorite health and summer resort and is a trade center for a large area. Its industries include dairying and the manufacture of flour, leather, furniture and wagons. It is the seat of the University School and several other schools. It has a public library. Pop. (1920), 40,472.

KENRICK, FRANCIS PATRICK (1797-1863), an American Roman Catholic archbishop; *b.* in Dublin, Ireland. He came early in life to the United States, and after studying theology, became a priest. In 1830, he was made bishop coadjutor of Philadelphia, and, in 1851, was transferred to the see of Baltimore. He was a notable scholar and theologian.

KENRICK, PETER RICHARD (1806-1896), Roman Catholic archbishop; *b.* Dublin, Ireland; *d.* St. Louis, Mo.; *bro.* of Bishop Francis Patrick Kenrick. After studying theology at Maynooth College he became priest in 1830, and three years later came to the United States. In 1835 he served as pastor of the Philadelphia Cathedral Parish. Later he taught dogmatics at the diocese seminary and became vicar-general. In 1841 he was appointed bishop-coadjutor of St. Louis, and two years later succeeded to the bishopric. He became Archbishop of St. Louis in 1847. He founded many churches and schools, and challenged the dogma of papal infallibility.

KENSINGTON (51° 30′ N., 0° 11′ W.), borough of London; contains K. Gardens, with the palace in which Queen Victoria was born, Natural History and South K. Museums, St. Mary Abbot's Church, Brompton Oratory. Pop. (1921) 175,686.

KENT (*c.* 51° 15′ N., 0° 35′ E.), county in S. E. extremity of England, between Thames estuary and Eng. Channel; area, 1,555 sq. miles; surface undulating in interior, rising in the Downs to over 800 ft.; drained by Thames, Medway, Stour, Darent; in S. E. is marshy district and in S. is region known as the Weald, famed for its scenery; N. W. corner is practically a suburb of London, with Woolwich Arsenal and Government dockyards of Sheerness and Chatham. K. suffered from Dan. invasions in X. cent. and was scene of various battles and insurrections from Norman times onwards; invaded by French in XIII. cent.; here occured Wat Tyler's rebellion, 1381, Jack Cade's, 1450. During Civil War K. was subdued by Roundheads. In 1667 Dutch fleet destroyed ships in Medway. Most important towns are Gillingham, Chatham, Maidstone, Tunbridge, Wells, Folkestone, Rochester, Ramsgate, Canterbury. K. is called the 'garden of England' from its beautiful scenery and rich cultivation. There are large tracts of woodland, with oaks and other valuable trees. Agriculture is chief industry; produces cereals, hops, fruits, vegetables; sheep and cattle raised; dairying and market-gardening carried on. At Whitstable and Faversham are oyster beds. Manufactures include gunpowder, bricks, paper. Pop. (1921), 1,141,867.

KENT, Kingdom of, Anglo-Saxon kingdom; said to have been established by Hengest and Horsa; here Christianity was first introduced into England during reign of Ethelbert, who *d.* 616; laws were codified by two of his successors, Hlothhere and Wihtred. K. apparently suffered from Saxon invasions in VII. cent.; in later times it was under control of earls.

KENT, EARLDOM AND DUKEDOM OF, titles held at various dates by Plantagenets, Hollands, Nevilles, Greys and by members of royal family; important holders were William Neville Earl of K. (*d.* 1463); supported Edward IV. in Wars of Roses; Edward Augustus Duke of K. (1799-1820), was *f.* of Queen Victoria.

KENT, CHARLES FOSTER (1867-), a university professor, *b.* at Palmyra, N. Y., *s.* of William Hotchkiss and Helen Maria Foster Kent. He was educated at Yale and at the University of Berlin. After being an instructor at the University of Chicago for three years he was assoc. professor and later professor of Biblical literature and history at Brown University from 1895-1901 and then became Woolsey professor of Biblical literature at Yale. In addition to contributing to magazines he edited several religious educational books and manuals and was the author of numerous books on Bible subjects including *Outlines of*

Hebrew History, 1895 and *The Shorter Bible, the Old Testament*, in 1921.

KENT, JACOB FORD (1835-1918), brigadier-general; *b.* Philadelphia, Pa. He graduated from West Point as the Civil War broke and entered that conflict as a second lieutenant, attaining the rank of colonel at its close. Afterwards he taught tactics at West Point and served at frontier and garrison posts. He saw service in Cuba and the Philippines in the Spanish-American war of 1898 and retired in that year.

KENT, JAMES (1763-1847), an American jurist, *b.* in Fredericksburg, N. Y. He graduated from Yale University, in 1781, studied law and began to practice in Poughkeepsie, N. Y. He was a member of the State Assembly in 1790-92. In the following year he was invited to fill the newly created chair of law in Columbia College, in New York City, but this position he was not able to fill long, as he was called upon to perform various public duties. He was first Recorder of the City of New York, then a justice of the State Supreme Court, then Chief Justice and in 1814 he was made Chancellor. In 1823 he retired from public office and again became professor of law at Columbia College. The lectures which he delivered there later became the basis of his four famous volumes, *Commentaries on American Law*, a work which has had a profound influence on the American legal profession, the first volume of which was published in 1827 and the fourth in 1840.

KENTIGERN, ST. (*c.* 518-603), also called St. Mungo; bp. of Cumbria; founded monastery at Cathures (Glasgow); fled to Wales and founded monastery of St. Asaph, named after his disciple. His feast-day is Jan. 13.

KENTON, a city of Ohio, in Hardin Co., of which it is the county seat. It is on the Toledo and Ohio Central, the Cleveland, Cincinnati, Chicago and St. Louis, and the Erie railroads, and on the Scioto river. It is an important center of trade for an extensive farming region. Its industries include the manufacture of iron products, hardware, tools, etc. Among the public buildings are a court house, city buildings, public library, and an armory. Pop. (1920), 7,690.

KENT'S CAVERN, KENT'S HOLE (50° 28′ N., 3° 31′ W.), cavern, near Torquay, England, where palæolithic tools, bone implements, remains of extinct animals have been found.

KENTUCKY (37° 50′ N., 85° 45′ W.), state U.S., bounded N. by Illinois, Indiana, and Ohio; E. by W. Virginia and Virginia; S. by Tennessee; W. by Missouri. Surface is undulating; mountainous in E., rising to about 3,000 ft. in Alleghany plateau, which is continuation of Appalachians. In S.W. are great cypress swamps. Principal rivers are Ohio, which forms northern boundary and its tributaries, Big Sandy, Licking, Kentucky, Green, Tradewater, Cumberland, Tennessee, and other streams; Mississippi forms part of W. boundary. There are some remarkable caves. Chief towns are Louisville, Covington, Lexington, Newport. Climate is temperate. Kentucky was originally inhabited by various Ind. tribes, and was first explored by white men in latter half of XVIII. cent. In 1791 it was admitted as state to Union and a constitution was framed. See Map of U. S.

Administration is carried out by governor, assisted by 8 executives; legislature consists of senate of 38 members, and house of representatives of 100 members, elected by popular vote for four and two years respectively. Kentucky sends two senators, 11 representatives to Congress. Principal religious denominations are Baptist, R.C., Methodist. Education is free and obligatory.

Resources, etc.—Kentucky is largely an agricultural state, most fertile district being the Blue Grass country; produces more tobacco and hemp than any other district of U.S., while it has also large crops of corn, wheat, and great quantities of fruit. Stock raising is largely carried on; especially famous for horses, while mules, cattle, sheep, and pigs are also raised in great numbers. There are large forests containing valuable timber. Extensive coal fields are found in both E. and W., other minerals, including iron, lead, salt, fluorspar, sandstone, petroleum. Among principal industries are lumbering, flour milling, tanning, manufacture of cotton-seed oil, hardware, clothing, cigars. Railway mileage exceeds 4,000. Area, 40,598 sq. miles. (417 sq. m. of water). Pop., 1920, 2,416,630.

KENTUCKY RESOLUTIONS, THE.—Passed by the Kentucky Legislature, in 1798 and 1799. They were against seditious and alien laws, and emphasized the rights of the states. George Nicholas introduced the Resolutions, of which Jefferson was the author. They were passed by the Lower House, on November 10, and by the Senate on November 13, 1798. The Resolutions defined a strict construction of relative power of state and government, asserting that when the Government assumed undelegated powers its acts were unauthoritive and void, and that 'to this compact (the Constitution) each state acceded as a state, and is an integral party, its co-

state forming as to itself the other party: that the government created by this compact was not made the exclusive or final judge of the extent of the power delegated to itself, but that in all cases of compact among parties forming no common judge. Each party has an equal right to judge for itself as well of infractions as of the mode and manner of redress.' Copies of the Resolutions were sent to all states, but only seven replied and in condemnatory terms. In November, 1799, the Kentucky legislature reaffirmed the Resolutions. See Warfield *Kentucky Resolutions of 1798.*

KENTUCKY RIVER, a waterway, having its head streams in several forks that flow from the Cumberland Mountains on the S.E. of the state, and winds N.W. into the Ohio River between Cincinnati and Louisville. For much of its distance of 260 miles through the state, it penetrates perpendicular walls of limestone and has locks and dams to enable craft to navigate it beyond Frankfort. In Jessamine co. a bridge crosses the gorge 307 ft. above low water.

KENTUCKY, STATE UNIVERSITY OF, a co-educational seat of learning, situated at Lexington. It dates from 1865, when it was a part of the original Kentucky University, now Transylvania University, and was reorganized in 1880 under state control and given its present title. Its departments include agriculture, engineering, law, science, and the regular collegiate and graduate courses. The institution, which has a campus of 72 acres, is connected with an agricultural experimental farm of 250 acres, and co-operates with the Federal Department of Agriculture in promoting statewide education in farm work. In 1922, the students numbered 1,881, and there were 150 teachers under the direction of F. L. McVey.

KENYA, or **KENIA** (0° 11′ S., 37° 20′ E.), volcanic peak, Brit. E. Africa; lower slopes are forested. Height, 17,007 ft. The name, 1920, was given to *British East Africa.*

KENYON COLLEGE, situated in Gambier, Ohio, was founded by the Protestant Episcopal Church, in 1824, as a theological seminary. In 1891 it became known as Kenyon College, and its curriculum was broadened to include collegiate and preparatory courses. Later the preparatory school was discontinued. Only male students are admitted, the institution not being co-educational. Among its benefactors was Mark Hanna, who gave $60,000 towards building a new dormitory. Many notable men were educated at the college, among them Rutherford B. Hayes and Edwin M. Stanton. In 1922, there was a student roll of 225, and a faculty of 10, under the presidency of the Rev. W. F. Peirce, D.D.

KENYON, WILLIAM SQUIRE (1869), Federal judge; *b.* Elyria, Ohio. He studied law at the Iowa State University and practiced at Fort Dodge, in that state, with which his career early became identified as prosecuting attorney of Webster co., and district judge. From 1907 to 1910, he was district attorney and general counsel for the Illinois Central Railroad, and thereafter acted as assistant to the U.S. Attorney General for a brief period. In 1911, he was chosen U.S. Senator from Iowa, and served until 1921, when he resigned upon being appointed by President Harding as a judge of the U.S. Circuit Court. While in the Senate he became of note as leader of the farm bloc and for his support of progressive legislation.

KEOKUK, a city of Iowa, in Lee co. It is on the Burlington Route, Chicago, Rock Island and Pacific, and other railroads, and at the junction of the Missouri and Des Moines Rivers. The city lies at the foot of the lower rapids which are skirted by a ship canal, 11 miles long, which was constructed by the Federal Government. In 1913, the great dam was completed, and one of the largest hydraulic-electric power plants in the world was established there. There is a large commerce by river and important industries, which include the making of foundry products, boots and shoes, canned goods, machinery, etc. Among the institutions of the city are several academies, and a home for the friendless. There is a United States Government building and several libraries. Pop., 1920, 14,423.

KEOKUK, a North American Indian; *b.* in 1780; *d.* 1848. In 1823, he succeeded Black Hawk as chief of the Sacs and Foxes and moved with his tribe, across the Mississippi. He was killed in 1848, by the Black Hawks.

KEONJHAR (21° 30′ N., 85° 30′ E.); state, Bihar and Orissa, India. Pop. c. 288,000.

KEONTHAL, hill state, Punjab, India. Pop. 23,000.

KEPLER, JOHANN (1571-1630), Ger. astronomer; *b.* near Weil, Württemburg; studied at Tübingen univ.; app. prof. of Astron, at Gratz (Styria), 1593; owing to religious persecutions accepted Tycho Brahe's invitation to Prague, to assist in preparation of Rudolphine tables; succeeded Tycho as imperial astronomer;

pub. great work, *The New Astronomy; Commentaries on the Motions of Mars, 1609*. The discoveries which this volume records form the basis of physical astronomy. In it K. enunciated his first two laws relating to the motion of the planets; enabled to establish these laws only by means of accurate astronomical data, obtained by Tycho. The third law was contained in *The Harmonies of the World, 1619*, dedicated to James I.

KEPPEL, AUGUSTUS, VISCOUNT (1725-86), Brit. admiral; concluded treaty with Dey of Algiers, 1751; prominent at Quiberon, 1759; had share in capture of Havannah, 1762; held command against French, 1778; and fought unsuccessful action at Brest; First Lord, 1782.

KEPPEL, FREDERICK (1846-1912), art connoisseur; *b.* Tullow, Ireland. After graduating at Wesley College, Dublin, he came to New York City, and founded an art business with branches in London and Paris, in the conduct of which he acquired a high repute for his knowledge of etchings and engravings. He lectured and wrote on art subjects, notably on the work of Millet and Rembrandt.

KERAK (32° 42′ N., 36° 23′ E.), town, Palestine; walled and fortified; taken by Saladin, 1188. Pop. *c.* 7,800.

KERASUND (40° 55′ N., 38° 38′ E.), fortified town, Asiatic Turkey. Pop. *c.* 9,800.

KERBELA, MESHAD-HOSAIN (32° 35′ N., 44° 7′ E.), town, Asiatic Turkey; site of shrine of Hosain, visited annually by pilgrims. Pop. *c.* 65,000.

KERCH, KERTCH (45° 22′ N., 36° 29′ E.), important fortress and seaport of S. Russia, on Strait of Yenikale, between Azov and Black Sea; has interesting catacombs and tombs, where wall-paintings and other works of art have been found; old Byzantine church; exports cereals, iron. Greatly damaged during Crimean War. Pop. 54,000.

KERENSKY, ALEXANDER FEODOROVICH (1881), Russian revolutionary leader; was *b.* in Tashkent, Russian Turkestan; received univ. education and took up practice of law, devoting himself especially to the cause of oppressed peasantry and working classes. In 1913, elected to the Duma as Socialist-Labor deputy for Saratov, and distinguished himself by attacks on the pro-German element in the government and on corrupt high officials. One of the leaders in the resistance to the Tsar's decree dissolving the Duma, March 12, 1917. After the Revolution (see RUSSIA: *History*) he was made minister of justice under Prince Lvoff; one of his first acts was to release all political prisoners in Siberia. In May, 1917, when Ger. gold was seducing the soldiery and the extremists were stirring them up to lay down their arms, and fraternize with the enemy, he became minister of war, and strove manfully to stop the rot that was threatening the army with decay and the country with disaster. He appointed Brussilov head of the army, and inspired the splendid offensive of July-Sept., 1917. Then came the reaction. There were dissensions in the ministry and a revolt in Petrograd; Kornilov's soldiers mutinied and left their positions, and the whole front collapsed. Prince Lvoff resigned and Kerensky became premier, July 20, 1917. Soon after Kornilov started a revolutionary movement against the government, and civil war began. Kerensky placed himself temporarily at the head at the head of the army, with Alexeieff as chief of staff. Kornilov was placed in custody, and on Sept. 15, a republic was proclaimed, with a council of five headed by Kerensky. By this time, Kerensky's fall was impending. Trotsky became president of the Petrograd Soviet, and with his confederate, Lenin, carried out a *coup d' etat*, Nov. 7. Deserted by his followers at Tsarskoe Selo, Nov. 14, after a feeble attempt to lead a military force against the Bolsheviks, Kerensky fled, and his career, for the time, was at an end.

KERGUÉLEN ISLAND, DESOLATION ISLAND (*c.* 50° S., 70′ E.), in Southern Ocean; named after discoverer, Kerguelén-Trémarec, 1772; mountainous; highest peak, Mt. Ross, 6,140 ft. Produces vegetable called K. cabbage. Annexed by France in 1893. Area, *c.* 1,450 sq. miles. Uninhabited.

KERKUK, QERQUQ (35° 27′ N., 44° 22′ E.), town, Turkey-in-Asia. Pop. *c.* 13,500.

KERMADEC (30° 40′ S., 178° 30′ W.), islands, belonging to New Zealand, Pacific Ocean.

KERMAN (29° 25′ N., 57° E.), province, Persia; area, *c*, 59,500 sq. miles; surface generally mountainous, especially in S., with great expanses of desert in N. and N.E.; produces cotton, dates, wool. Pop. *c.* 600,000. Capital, Kerman, is fortified; manufactures carpets. Pop. *c.* 60,000.

KERMANSHAH, KERMANSHAHAN (34° 20′ N., 47° E.), town, K. province, Persia; carpets. Pop. 50,000. K. province has pop. *c.* 400,000.

KERMES, crimson dye from the dried female insect *Coccus ilicis*, found on

Quercus coccifera in region of Mediterranean; inferior to, and largely superseded by, *cochineal*, but used for dyeing Turk. fez.

KERNER, JUSTINUS ABDREAS CHRISTIAN (1786-1862), Ger. poet of the 'Swabian school'; *b.* Ludwigsburg, Württenberg; wrote *Reiseschatten von dem Schattenspieler Lux*, *Romantische Dichtungen* and *Der letzte Blütenstrauss*; also works on animal magnetism.

KEROSENE (Gk. word, wax), a colorless mixture of liquid hydrocarbons distilled from petroluem, coal, etc., and used for lighting purposes. The specific gravity varies from .780 to .825, the boiling point is about 170° F., and flash point 149° F. See PETROLEUM.

KERRY (52° N., 9° 50′ W.), W. coast co., Munster, Ireland; bounded N. by Shannon, E. by Limerick, Cork, S. by Cork, W. by Atlantic; area, 1,813 sq. miles; coast deeply indented; surface generally mountainous, crossed by Macgillicuddy's Reeks, rising to 3,410 ft. in Carran Tual, highest peak in Ireland. Rivers are unimportant. K. contains famous Lakes of Killarney, celebrated for beautiful scenery. Mineral springs occur in various parts. K. produces potatoes, oats, slate; well-known strain of cattle reared; dairy-farming carried on. Pop. 160,000.

KERSAINT, ARMAND GUY SIMON DE COETNEMPREN, COMTE DE (1742-93), Fr, naval officer; of noble birth, but joined Revolutionists; supported deposition of Louis XVI., but was against his execution; owing to increased opposition K. was tried and executed.

KESTER, PAUL (1870), an American dramatist; *b.* at Delaware, O.; *s.* of Franklin Cooley and Harriet Watkins Kester. He was educated at private schools and by private tutors. In addition to writing numerous poems, he was the author of *His Own Country*, and *Tales of the Real Gypsy*, and wrote a great many plays produced both in this country and abroad, some of which are: *When Knighthood was in Flower*, produced by Julia Marlow; *Mademoiselle Mars*, produced by Mrs. Langtry; *Don Quixote*, produced by E. H. Sothern; *The Bill Toppers*, produced by Marie Tempest; *The Lady in the Case*, produced by Annie Russell; and others.

KETCHUP, condiment made from tomato, mushroom, or walnut, boiled with salt and spices.

KETTERING (52° 24′ N., 0° 44′ W.), town, Northamptonshire, England. Pop. 13,000.

KETTLEDRUM, musical instrument of percussion, consisting of wood or metal frame over which is stretched skin or parchment, which is beaten with drumsticks of whalebone, having wooden knob at end covered with sponge or other soft material. K. is of Eastern origin, generally cylindrical in shape, and plays a definite note in harmony with the music which it accompanies. Two or three are required with full orchestra, one large with compass from F to C, and smaller ones Bb to F on bass stave.

KEUPER, term given to the uppermost division of the Triassic system. In Great Britain the K. are divided into Rhætic or Penarth beds, the Upper K. marl and the Lower K. sandstone.

The Rhætic contains rock salt, which is mined in Cheshire and other localities. K. has a few fosil remains including few plants of cypress order, calamites, and fishes.

KEW (51° 29′ N., 0° 18′ W.), town, suburb of London, Surrey, England; site of Royal Botanic Gardens, founded 1759 by *m.* of George III.

KEWANEE, a city of Illinois, in Henry co. It is on the Burlington Route railroad, and is the center of an extensive farming region. It has also a number of important industries. Pop., 1920, 16,026.

KEWATIN. See KEEWATIN.

KEW-KIANG, or **KIU-KIANG**, a city and seaport of China, in the Kiangsi province. It is on the S. bank of the Yang-tse-Kiang River. It has a large trade in tea. Pop. about 60,000.

KEY, simplest form designed (by ancient Egyptians) to raise pegs placed through staples; later form to compress springs which hold lock. Modern locks consist of series of wards, to which key is shaped.

KEY, ELLEN (KAROLINA SOFIA) (1849), a Swedish writer and feminist; *b.* in Smalend. She wrote from 1870 on a variety of subjects relating to women and women's work. From 1899 to 1910 she lived abroad. Her radical ideas of love and marriage created much discussion and considerable criticism. Her works include *Love and Ethics*, and *The Younger Generation*.

KEYS, FLORIDA. See FLORIDA KEYS.

KEY, FRANCIS SCOTT (1780-1843), American lawyer and poet; *b.* Frederick co., Maryland. He was educated at St. John's College, Annapolis, and entered on the practice of law, beginning at Frederick City and afterward removing

to Washington, where, for some years, he was district attorney of the District of Columbia. In the War of 1812, he was a prisoner on a British ship and witnessed the bombardment of Fort McHenry, near Baltimore, 1814. The relief he experienced, when on the following morning he saw that the American colors were still floating over the fort found expression in *The Star Spangled Banner*, which set to the music of *Anacreon in Heaven*, achieved enormous popularity and has since established itself as the national anthem. A volume of his poems was published posthumously, in 1856.

KEYBOARD, a succession of keys set in the case or framework of certain musical instruments; supposed to have come into use about XIV. cent.; Spinet, one of oldest instruments, had K. consisting of black 'naturals' and white 'sharps,' compass four octaves and a half-tone; most modern pianofortes have white 'naturals' black 'sharps,' and compass of seven octaves in instruments having more than one K. (*e.g.* organ), each row is called a *manual*.

KEYES, HENRY WILDER (1863), a U.S. senator; *b.* at Newbury, Vt.; *s.* of Henry and Emma Frances Pierce Keyes. He graduated from Harvard, in 1887. In addition to being engaged extensively in farming for many years, he was pres. of Woodsville, N. H., National Bank. He was a member of the New Hampshire House of Rep., from 1891-5, and again, 1915-17; also Senate, 1903-5; was a member of the State Excise Commn., from 1915-17; governor of New Hampshire, 1917-19; and U.S. Senator for the term 1919-25.

KEY WEST, a city of Florida, in Monroe co., of which it is the county seat. It is on the Florida East Coast railroad, and on the Gulf of Mexico. It is a port of entry and a station for the United States navy. Key West is built on an island of the same name. It is about 50 miles off the coast. The island is 7 miles long by 1 to 2 miles wide. It is a coral formation, and has an elevation of about 11 feet above sea level. It is covered by a thin layer of soil which is suitable for growing fruits. The city has a fine harbor and has regular steamboat communication with Atlantic Ocean and Gulf ports, and with Cuba. It also has regular communication by airplane with Havana The chief industry is the manufacture of cigars. It has also important fishing interests and is a favorite resort for deep sea fishing. The public buildings include a United States Marine Hospital, custom house, and United States courts. There is also a shipyard. Key West is the terminal of a chain of islands over which pass to the mainland the Florida East Coast Railroad, which is constructed over a stone and concrete roadway connecting the islands with each other and with the mainland. This enterprise was completed at a cost of $15,000,000, by Henry H. Flagler. This railroad makes it possible to run through trains between the United States and Cuba by means of an ocean ferry capable of carrying 30 cars at a time. The road was completed in 1915. Pop., 1920, 18,749.

KHABAROVSK, CHABAROWSK (48° 28′ N., 135° 32′ E.), cathedral town, Russia-in-Asia; center of trade in sables. Pop. 41,000.

KHAIRAGARH (21° 15′ N., 81° E.), native state, Central Provinces, India. Pop. 140,000.

KHAIRPUR.—(1) (26° 50′ N., 69° 10′ E.), native state, Bombay, India. Pop. 225,000. (2) (27° 33′ N., 68° 50′ E.), town, capital of above. Pop. 14,500.

KHAJRAHO (*c.* 25° N., 77° 35′ E.), village, Chhatarpur, Central India; fine old temples.

KHAKI, a name given to yellowish cloth employed as material in army uniforms by the principal governments; valued on account of its aid to invisibility; used largely in the World War.

KHALIFA, THE (1846-99), Arab. *Mahdi*; assisted the Mahdi Muhammad Ahmed in agitation in the Sudan; succeeded him, 1885, and died defending the Sudan against Britain.

KHAM, KHAMS (*c.* 31° N., 97° 30′ E.), province of Tibet; chief town, Chiamdo.

KHAMGAON (20° 45′ N., 76° 45′ E.), town, Berar, India; cotton, opium. Pop. 18,600.

KHAMSEH (36° 34′ N., 48° E.), province, Persia; chief town, Zenjan.

KHAN (Turk., Persian, and Arab.), word meaning 'lord' or 'ruler,' used sometimes simply as title of respect.

KHANDESH, EAST (20° 56′ N., 75° E.), district, Bombay, India; area, 4,545 sq. miles. Pop. 960,000. *K. West* (21° 28′ N., 74° 10′ E.), district, Bombay, India; area, 5,496 sq. miles. Pop. 475,000.

KHANDWA (21° 50′ N., 76° 24′ E.), town, Central Provinces, India. Pop. 20,000.

KHAR (33° 16′ N., 58° 53′ E.), province, Persia; produces wheat, barley, and rice in great quantities. Pop. *c.* 10,000.

KHARAGHODA (23° 22′ N., 71° 35′ E.), village, on Little Runn of Cutch, Bombay, India; salt factory. Pop. 2,500.

KHARGA, GREAT OASIS (*c.* 25° 30′ N., 30° 30′ E.), celebrated oasis in a deep depression in S. of Libyan Desert, Egypt; has Rom. and Egyptian remains; produces dates, cereals; chief town, K.; inhabited by Berber tribes. Pop. (oasis) 8,500, (town) 5,500.

KHARKOV.—(1) (49° 40′ N., 37° E.), government, S.W. Russia; area, *c.* 21,041 sq. miles; horses, cattle, sheep, silkworms, beet. Pop., 1910, 3,245,900. (2) (50° N., 36° 14′ E.), town, capital of above; seat of Gk. abp.; univ. established, 1805; famous for great fairs. Pop. 270,000.

KHARPUT (38° 45′ N., 39° 30′ E.), town, Asiatic Turkey; rich in minerals. Pop. *c.* 25,000.

KHARSAWAN (22° 50′ N., 85° 50′ E.), native state, Bengal, India. Pop. 37,000.

KHARTUM (15° 36′ N., 32° 31′ E.), cap., Sudan, Egypt; near junction of Blue and White Niles, connected by rail with Upper Egypt and Port Suakin on Red Sea. *Omdurman* is 1 mile distant. For nearly a century emporium for ivory and gum of Sudan, and great slave market; celebrated for Gordon's defence against Mahdi, who captured it in 1885; retaken by Kitchener, 1898, since when it has been rebuilt; contains Gordon Memorial Coll.; Eng. cathedral. Pop. (including suburbs) 70,000.

KHASI AND JAINTIA HILLS (*c.* 25° 30′ N., 91° 30′ E.), district, between Brahmaputra and Surma Rivers, Assam, Brit. India; area, 6,025 sq. miles; mountainous; produces coal. Pop. *c.* 205,000

KHASKOY (42° N., 25° 35′ E.), town, Bulgaria. Pop. 15,000.

KHAZARS, ancient people inhabiting the shores of the Caspian Sea and the country of the Caucasus, as far as the Crimea, and conducting the carrying trade between Persia, Armenia, Byzantium, and Russia. Origin of the race is much disputed, but it is generally agreed that they are related to the Georgians, the 'Iberians,' or the Turks. An important people from 190 A.D. to 1100 A.D., and at the height of their influence from 600 A.D. to 950 A.D. Chief cities, Itil, on the Volga, Tarkhu, and Sarkel, on the Don. The nation was conquered and dispersed by the Russians at the end of the X. cent.

KHERI (30° 3′ N., 77° 56′ E.), district, Tow[illegible]ed Provinces, India; area, 2,960 sq. 13,00. Pop. 905,000.

KHERSON.—(1) (47° 40′ N., 32° 30′ E.), government, S.W. Russia, bordering on Black Sea; area, *c.* 27,337 sq. miles; produces cereals, tobacco. Pop. 3,447,100. (2) (46° 39′ N., 32° 32′ E.), town, capital of above; timber trade. Pop. 90,000.

KHINGAN, GREAT (*c.* 43° to 54° N., 117° to 122° E.), mountain range, Chin. Empire, E. Asia, to E. of Gobi Desert; rises to *c.* 8,000 ft. *Little K.* is range to E. of Great K.

KHIVA (anc. *Khorasmia*), state, Central Asia (42° N., 59° 30′ E.), watered by Amu; produces cereals, fruits, tobacco cotton, silk. Khiva has had relations with Russia since early XVII. cent., and was occupied by a Russian military force in 1873, when a heavy indemnity was exacted. Inhabitants are chiefly Turkomans; religion, Mohammedanism. Area, 24,000 sq. miles; Pop. *c.* 519,000. Capital, Khiva; manufactures silks, cottons, and carpets. Pop. *c.* 5,000.

KHOI (38° 37′ N., 45° 5′ E.), town, capital of K. district, Azerbaijan, Persia; fortified. Pop. *c.* 33,000.

KHOJENT (40° 15′ N., 69° 32′ E.), walled town, Russ. Turkestan; silks, cottons. Pop. 41,000.

KHOKAND, KOKAND (41° 22′ N., 70° 38′ E.), town, Ferghana, Asiatic Russia; commercial center; produces silk, cotton. Pop. 113,000. The former khanate of K. came under Russ. control in 1876, and now forms government of Ferghana (*q.v.*).

KHOLM (51° 8′ N., 23° 32′ E.), town, Poland. Pop. 20,000.

KHORASAN, KHORASSAN (34° 40′ N., 56° E.), province, N.E. Persia; area, *c.* 170,000 sq. miles; surface generally mountainous, with desert plains in S.; chief mountains, Elburz range; produces best wool in Persia, also rice, wheat, tobacco, aromatic plants, fruit, turquoises; manufactures carpets, textiles; capital, Meshed. Pop. *c.* 1,000,000.

KHORREMABAD (33° 30′ N., 48° 30° E.), town, Persia. Pop. *c.* 6,000.

KHORSABAD (*c.* 36° 26′ N., 43° 10′ E.), village, Asiatic Turkey, where Sargon's palace, dating from VIII. cent. B.C., was excavated by Fr. archæologists in XIX. cent.

KHOTAN (37° 4′ N., 80° 36′ E.), town and oasis, E. Turkestan; center of oasis producing cereals, fruits; local products are carpets, silk, and jade. Pop. *c.* 5,000. District has area of 400 sq. miles. Pop. *c.* 150,000.

KHULNA (22° 30′ N., 89° 32′ E.), district, Bengal, India. Pop. 1,255,000. *Khulna*, chief town. Pop. 11,000.

KHUNSAR (33° 10′ N., 50° 24′ E.), town, Persia. Pop. *c.* 10,000.

KHURJA (28° 14′ N., 77° 52′ E.), town, United Provinces, India; important commercial center. Pop. 30,000..

KHUZISTAN, or **ARABISTAN** (anc. *Susiana*), prov., S.W. Persia (between 30°-33° N., 48°-52° E.); mostly mountainous, but soil in valleys very fertile. Rice, maize, barley, dates, cotton, wool, and gums are produced. Opium and tobacco (from Ispahan) are exported. Area, 25,700 sq. miles. Pop. 200,000. Cap., Chuster; pop. 10,000.

KHYBER PASS, KHAIBAR PASS (34° 14′ N., 71° E.), great pass from India to Afghanistan, through Safed Kohand Sulaiman mountains, 33 miles long, 10 to 450 ft. wide, with rocky precipices rising on each side to heights of 1,400 to over 3,300 ft. Summit is at Landi Kotal.

KIANG-SI (28° N., 116° E.), province, E. China; area, *c.* 69,480 sq. miles. Pop. 16,255,000.

KIANG-SU (34° N., 119° E.), coast, province, China; area, *c.* 38,600 sq. miles. Pop. 15,380,000.

KIAOCHOW, or **CHIAO-CHOU,** tn., harbor, and dist. (area, *c.* 220 sq. m.), S. coast Shantung Peninsula (36° 30′ N., 118° 30′ E.); exacted under ninety-nine years' lease from China by Germany, 1897, and developed; had thirty-three townships and native pop. of 192,000; Tsing-tau, the port, turned into powerful fortress with entrenched camp; harbor constructed; naval station; 'a model of Ger. kultur'; declared a protectorate in 1898. At outbreak of World War, Japan demanded its surrender; on refusal, Kamio with Jap. army, assisted by Brit. force (S. Wales Borderers and 500 Sikhs) under General Barnardiston, marched on Tsing-tau; vigorous bombardment from sea; Ger. warships replied, but were driven off and one sunk. Final assault on fortress, on Nov. 7, 1914; the terms of surrender signed that evening. By Treaty of Versailles, 1919, Germany renounced all rights to Japan, which, in turn, transferred possession of the city, to China, in 1923.

KIAOCHOW BAY (36° 18′ N., 120° 10′ E.), harbor, S. of Shantung peninsula, China.

KIDD, BENJAMIN (1858), an American sociologist and writer. His books include *Social Revolution*; *The Control of the Tropics*; *Herbert Spencer and After*; and *The Two Principal Laws of Sociology.*

KIDD, CAPTAIN (WILLIAM) British mariner; supposed to have been *b.* in Greenock, Scotland, about 1650, the *s.* of a Scottish non-conformist minister; hanged in London for murder and piracy, in 1701. He followed the sea from his early youth and became identified with the maritime commerce of the colony of New York, where he acquired fame in protecting British shipping from pirates in American waters. His services to the colony earned him a reward of L150 from the Council of New York in 1691. In suppressing piracy he became a privateer under letters of marque from the British in the war with France, and also held a roving commission to raid and capture piratical craft wherever found. The King's commission referred to him as 'our trusty and well-beloved Captain Kidd.' In 1696, in the reign of William III., he commanded the *Adventure*, a galley carrying a crew of 80, and 30 guns, which sailed from New York from Plymouth, in April, to sweep the seas of the marauders who were destroying British commerce. In New York he reinforced his crew to 150 men. Leaving that port, he sailed for Maderia and was next heard of on the East African coast, where it was rumored that in pursuing pirates he had himself turned pirate. He had the temerity to return to New York with considerable treasure, supposed to have been captured from Moorish, Portuguese, and Armenian craft, and buried much of the booty on Gardiner's Island, off Montauk Point, Long Island. His notoriety as a pirate had preceded him, but he believed his commission shielded him from any charge. Though proclaimed a pirate, he went boldly to Boston and delivered to the colonial governor (Lord Bellomont) a quantity of gold and silver and many bales of sugar and other merchandise. He was arrested, not for piracy, as to which there was no tangible and legal proof, but on a charge that he had killed a mutinous gunner on board his ship. His trial, in London, for murder and piracy was viewed as unjust, the evidence submitted being inconclusive, and he was hanged, protesting his innocence, with several of his crew, at Execution Dock, on the Thames. His deeds became widely fictionized in popular romances, which invented a piratical character that bore little or no resemblance to the real Captain Kidd. Tradition credited him with burying much spoil on the shores of the Hudson River and Long Island Sound, but searchers for it, down to the present day, have been fruitless. The colonial authorities recovered the booty he had concealed on Gardiner's Island.

KIDDERMINSTER (52° 23′ N., 2° 15′ W.), town, Worcestershire, England; important carpet manufactures; has old parish church. Pop., 1921, 27,122.

KIDNAPPING is defined by Blackstone as the forcible abduction or stealing away of a man, woman or child from their own country and sending them into another. It is now, however, usually confined to the offence of child-stealing, or the crime of leading, taking, or enticing away a child underfourteen, with intent either to deprive the parent or other person having lawful care or charge of the possession of the child or to steal any article upon the child.

KIDNEY, term applied to each of two glands, forming part of the urinary system (*q.v.*), the function of which is the excretion of the urine. In man they are situated against the posterior wall of the abdomen, one of each side of the vertebral column, covered by the twelfth rib and opposite the last dorsal and first three lumbar vertebræ, the right K. being slightly lower in position than the left. In form they are characteristic, having a convex outer border and a concave inner border, with somewhat bulging extremities, the average length being rather over 4 in., and the weight 4 to 6 oz., while their color is a brownish red. There is a fissure on the concave inner border at which the ureter, which conveys the urine to the urinary bladder, the branches of the renal vein, and the renal artery enter the K., the ureter dilating within to form a sac termed the pelvis of the K. A tough fibrous coat envelops the K., and if a longitudinal section is made through the organ it is found to consist of two more or less distinct layers, the outer termed the cortex, and the inner the medulla. The former contains minute round bodies, termed Malpighian bodies, to each of which runs an afferent artery, and from each of which comes an efferent vein, while the capsule of the body goes a uriniferous tubule, the function of the Malpighian bodies being the excretion of the urine from the blood. The medulla consists of about a dozen pyramidal masses, each of which is composed of uriniferous tubules, the apices pointing into the pelvis of the K. The pelvis is lined with mucous membrane which is continuous with that of the ureter and the urinary bladder, and this sac acts as a preliminary receptacle for the urine before it is conveyed to the bladder.

KIDWELLY (51° 45′ N., 4° 18′ W.), town, Carmarthenshire, Wales; old castle. Pop., 1921, 3,181.

KIEL (54° 19′ N., 10° 9′ E.), seapt. town, Holstein, Prussia, on inlet of Baltic; near entrance to Kiel Canal; important Ger. naval station; fine harbor strongly fortified; has univ., observatory, museum, old palace; shipbuilding, foundries, breweries; naval academy. During the World War Kiel played an important part as a German naval base. In Nov. 3, 1918, riots occurred among Ger. naval crews, and four days later the town was reported to be in revolutionary hands. Next day the fleet passed into the hands of the rebels, and Prince Henry of Prussia fled. Pop. 205,330.

KIEL CANAL extends through Schleswig-Holstein from Brunsbüttel on Elbe to Holtenau on Kiel Bay, thus uniting North Sea with Baltic. Breadth at bottom, 72 ft.; at surface, 213 ft. Begun June, 1887; opened June, 1895. Work of enlarging and deepening canal completed June, 1914, six weeks before outbreak of World War. Harborage of Ger. High Seas Fleet during most of the war. By Treaty of Peace (Art. 380), to be free and open to vessels of all nations at peace with Germany, on terms of entire equality.

KIELCE.—(1) Government Poland; iron, coal, and cereals. Area, 3,897 sq. m. Pop., 1921, 2,537,127. (2) Town, capital of above (50° 52′ N., 20° 40′E.); iron and sugar factories; ropes, dyes, cottons, cement. During the World War, taken by Austrians, Aug., 1914; evacuated in Nov., and recaptured May,1915. Pop., 1921, 41,357.

KIEV.—(1) Prov., Ukraine; surface forms plateau, well wooded; drained by Dneiper; produces beetroot, cereals, tobacco, oil; it manufactures sugar, spirits, machinery, bricks, iron goods. Area, 19,676 sq. m.; pop. 4,988,000. (2) Chief town of above (50° 27′ N., 30° 30′ E.); once cap. of Muscovite empire; important eccles. center since 988, when Christianity was here introduced into Russia by St. Vladimir; cathedral of St. Sophia, dating from XI. cent., is oldest in Russia; site of Pecherskoi Monastery, which, traditionally founded by St. Anthony in XI. cent., is annually visited by many thousand pilgrims, and has famous catacombs; commercial center for S.W. Russia; sugar industry; 5 annual fairs; strongly fortified. Pop. 610,200.

KIKUYU, or **KENIA** (0° 50′ S.; 37° 10′ E.), dist. of Brit. E. Africa, in Ukamba prov., bordering Uganda on the W. It includes Mt. Kenia, and, ranging in elevation between 4,500 and 18,600 ft., enjoys a temperate climate. Pop. (est.) 323,000.

Kikuyu Conference, of missionaries working in Brit. E. Africa, was held in 1913; at close, joined in communion ac-

cording to English Church Prayer Book; a bitter controversy ensued. Case referred by Archbishop of Canterbury to consultative body of Lambeth Conference, and held by it to be abnormal and irregular.

KILAUEA, a volcanic crater in the E. part of the Hawaii Island, on the E. slope of Mauna Loa, 4,000 ft. above the sea level.

KILBARCHAN (55° 51′ N., 4° 33′ W.), town Renfrewshire, Scotland; manufactures textiles, paper. Pop. 8,000.

KILBIRNIE (55° 46′ N., 4° 41′ W.), town, Ayrshire, Scotland. Pop. 8,000.

KILDA, ST., a small rocky island in the Atlantic Ocean, off the coast of Scotland, to which it belongs.

KILDARE (53° 12′ N., 6° 45′ W.), county, Leinster, Ireland; area, 654 sq. miles; most of surface is flat, with bogs in N.; watered by Liffey, Boyne, Barrow, and crossed by two canals. Chief industry is agriculture; produces potatoes, oats, barley; live stock raised. Brewing and distilling are carried on. K. has numerous monastic ruins and some ancient earthworks and round towers. Pop. 68,000. *Kildare* (53° 9′ N., 6° 54′ W.), the county town, has a cathedral.

KILIMANJARO (3° 5′ S., 37° 22′ E.), extinct volcanic mountain to E. of Victoria Nyanza, Ger. E. Africa; highest point is volcanic cone of Kibo (*c.* 19,700 ft.), which is connected with Kiwamenzi (*c.* 17,000 ft.), by high plateau 7 miles in length.

KILKENNY (52° 35′ N., 7° 15′ W.), county, Leinster, Ireland; area, *c.* 798 *sq.* miles; surface undulating, rising in N.E. to over 1,000 ft; drained by Barrow, Nore, Suir. Produces black marble, anthracite coal; manufactures beer, whiskey, flour, woolens. K. has several monastic ruins. Pop. 75,000.

KILKENNY (52° 39′ N., 7° 14′ W.), town, K., Ireland; name derived from Cathedral of St. Canice, built here in XIII. cent.; ruins of Franciscan and Dominican abbeys and old round tower remain; castle, dating from XII. cent., is residence of Marquesses of Ormonde. Has R.C. cathedral. Pop. 11,000.

KILLARNEY (52° 3′ N., 9° 30′ W.), town, County Kerry, Ireland; has R.C. cathedral; in vicinity are the lakes of K., famous for beautiful scenery. Pop. 6,000.

KILLIECRANKIE (56° 44′ N., 3° 47′ W.), pass, Perthshire, Scotland; where Claverhouses defeated Mackay, 1689.

KILLIFISHES (*Cyprinodontidæ*), herbivorous, worm- or insect-eating bony fishes, with long slender bodies, scarcely ever a foot long. Most interesting is the Double-Eyes or Four-Eyes Fish (*Anableps*), so called because each eye is divided into an upper and lower portion, for observing upwards into the air and downwards at the same time. Found in the warmer fresh or brackish waters of both hemispheres.

KILLIGREW, THOMAS (1612-83), Eng. dramatist; *b.* London; groom of the bedchamber to Charles II.; plays include *Claracilla*, *The Pilgrim*, and *The Parson's Wedding*.

KILLIS (36° 43′ N., 37° 8′ E.), town, Syria. Pop. *c.* 20,000.

KILMARNOCK (55° 37′ N., 4° 29′ W.), town, Ayrshire, Scotland; manufactures carpets, textiles, cheese, iron goods. Pop. 35,000.

KILMER, JOYCE (1886-1918), journalist and poet; *b.* New Brunswick, N.J.; *d.* France. He graduated from Columbia, taught Latin in a New Jersey high school, and in 1913 joined the staff of the *New York Times* as a writer, for which he became known as an interviewer of notable persons. He wrote several books of poetry, contributed to current periodicals, and edited an anthology of Catholic poets. In the World War he served as a private in the 165th Infantry (69th of New York) and in August, 1918, was killed in the course of the American advance that drove the Germans from the Marne salient.

KILN. See BRICKS.

KILOGRAM, or **KILOGRAMME,** a Continental measure of weight, which is equal to 1,000 grammes, *i.e.* about 2.2046 lbs.; 1,000 Ks. make a metric ton, *i.e.* 2204.6 lbs. See METRIC SYSTEM.

KILOWAT. See ELECTRICITY.

KILPATRICK, NEW, or **EAST** (55° 57′ N., 4° 21′ W.), town, Dumbartonshire, Scotland. Pop. 14,000.

KILPATRICK, OLD (55° 56′ N., 4° 27′ W.), town, Dumbartonshire, Scotland. Pop. 46,000.

KILWA-KISIWANI (9° S., 39° 29′ E.), ancient walled town, on island, Ger. E. Africa; ruined mosques, palace.

KILWA-KIVINJE (8° 40′ S., 39° 25′ E.), seaport, Ger. E. Africa. Pop. 101,000.

KIMBALL, SUMNER INCREASE (1834-1923), ex-general superintendent of U.S. Life Saving Service; *b.* at Lebanon, Me.; *s.* of Increase Sumner and Miriam White Bodwell Kimball. He was graduated from Bowdoin, in 1855. He was

admitted to the bar, in 1858, and the following year was a member of the legislature, after which he was chief clerk of the 2nd auditor's office in the U.S. Treasury Dept.; was later chief of the Revenue Marine and Life Saving Service; and, 1878, was made gen. supt. of the U.S. Life Saving Service, from which position he was retired, in 1916, on three-quarters pay. Author of: *Organization and Methods of the United States Life Saving Service, 1889*; and *Joshua James—Life-Saver, 1909*.

KIMBALL, WILLIAM WIRT (1848), a rear-admiral, U.S.N.; *b.* at Paris, Me.; *s.* of Brig.-Gen. William King and Frances Freeland Rawson Kimball. He graduated from the U.S. Naval Academy in 1869, and after serving on various stations and advancing through the different grades, was made a rear-admiral, in 1908. He did a great deal towards the development of the torpedo boat, also magazine and machine guns, and the submarine. He organized the first torpedo boat flotilla of the U.S.N., and designed, constructed, and operated the first armed cars used by United States forces. He was retired by the operation of the law, in 1910, but was recalled to active duty during the World War, as president of the board for the examination of officers.

KIMBERLEY, the northern district of Western Australia in which gold fields were discovered in 1886. It has very valuable tracts of agricultural land. The chief port is Derby on the Fitzroy river.

KIMBERLEY (28° 46′ S., 24° 51′ E.), chief town, and diamond-mining center of Griqualand West, Cape of Good Hope Colony, 646 miles by rail N.E. of Cape Town. Diamonds were first discovered at Du Toit's Pan and Bultfontein, 1870, followed in succession at Kimberley, De Beers, and Wesselton. The mines are all controlled by the De Beers Co., which, in order to avoid over-production, closed the De Beers, 1908, and the Kimberley, 1909. A stone weighing 442 carats, found in Du Toit's Pan, 1917, is reported to be finest and most valuable stone ever found in Griqualand West. The annual output is about $25,000,000. Besieged by Boers, Oct. 15, 1899; relieved Feb. 16, 1900. Pop., 1921, 39,320.

KIMBERLEY, JOHN WODEHOUSE, FIRST EARL OF (1826-1902), Brit. statesman; cr. earl, 1866; held various important portfolios in Liberal Cabinets from 1852 to 1895.

KINCARDINESHIRE (56° 58′ N., 2° 25′ W.), also called *The Mearns*, E. maritime co., Scotland; area, *c.* 382 sq. miles; rises from coast to Grampian Mountains, which run E. and W. across county; watered by North Esk, Bervie, Dee, and other streams; chief towns, Stonehaven (capital), Laurencekirk, Bervie, Banchory; no important manufactures; produces oats; cattle and sheep raised; fishing important. Pop., 1921, 41,779.

KINCHINJUNGA (27° 45′ N., 88° 8′ E.), high mountain peak, Himalayas, over 28,000 ft.

KINDERGARTEN, school founded by Frederick Froebel, in 1837, at Blankenburg, Central Germany, on a system based on self-activity of the pupil. Teacher is benevolent superintendent who studies child nature, and aids that nature to develop itself. This is the principle underlying the very elaborate system of gifts and occupations which form such a prominent part of the Froebellian scheme. The six 'gifts' are as follows: (1) Six balls of colored worsted, representing the primary and secondary colors; (2) a wooden sphere, cylinder, and cube; (3-6) three large wooden cubes divided up in various ways—*e.g.*, 3rd gift is subdivided into eight smaller cubes; in remaining gifts subdivision is carried further, and parts include square, rectangular, and triangular prisms, as well as cubes. A great deal in ingenuity is shown in inventing games in which these gifts are utilized. In first two gifts work is mainly perceptual; in remaining four, opportunity is afforded for exercise of self-activity; child is encouraged to make new combinations: (1) forms of *beauty*; (2) forms of *knowledge* (illustrating number and rates, etc.); (3) forms of *life*. There are many other occupations, including beadwork, stick laying, laths, sewing, paper folding, paper cutting, mat plaiting, brickwork. Games, stories, and songs form an important part of the system. Kindergarten methods in some form or other now constitute part of the operations of every properly conducted infant school.

KINEMATICS, a branch of the science of mechanics, in which motion is considered without reference to any force.

KINETIC ENERGY. — Energy, in physics and mechanics, is defined as the capacity for doing work. *Kinetic energy* is energy due to motion, in contradistinction to *potential energy*, which is energy due to position or state of strain. A few examples will make these definitions clear. A stone on the top of a cliff possesses potential energy, because it can do work by falling from the top of the cliff to the bottom. Immediately, however, it is rolled over the edge of the cliff, its energy becomes partly kinetic, owing to the fact that it is moving. The energy

of a pendulum at the end of each stroke is wholly potential, because it is momentarily at rest, but is capable of doing work because of its position. At the middle of its stroke, it loses all its potential energy, its energy being then kinetic. At intermediate points, its energy is partly potential and partly kinetic. The energy of an arrow resting on a stretched bow is potential; as it flies through the air, the energy is mainly kinetic. A coiled spring possesses potential energy due to state of strain; a travelling automobile possesses kinetic energy due to its motion. The kinetic energy of a body is proportional to its mass and to the square of its velocity. The kinetic energy of a swinging hammer weighing 2 lbs. is twice that of a hammer weighing 1 lb. If swung at a velocity of 10 feet per second, its kinetic energy is one hundred times as much as if it is swung at a velocity of 1 foot per second.

KINETICS. See DYNAMICS.

KINETOSCOPE. See CINEMATAGRAPH.

KING, title of sovereignty; O.E. *cyning,* signified chief of the tribe; word found in various forms in all Teutonic languages; principle of heredity may be called the fundamental characteristic of kingship; at first any member of king's family might be chosen to succeed him, but at later date the system of primogeniture was established.

KING, CHARLES (1844), an American soldier and author; *b.* at Albany, N.Y.; *s.* of Rufus and Susan McKown Eliot King. He graduated from the U.S. Military Academy, in 1866, and after advancing through various grades, was made a capt., in 1879. He was retired for wounds the same year, and was afterwards inspector and instructor Wis. National Guard; was brig.-gen. vols. during 1898-9, and served in the Philippine Islands, under General Lawton, in 1901. Author: *Famous and Decisive Battles, 1883*; *Captain Blake, 1892*; *The General's Double, 1897*; *A Conquering Corps Badge, 1902*; *Medal of Honor, 1905*; and others.

KING, CLARENCE (1842-1901), geologist and mining engineer; *b.* Newport, R.I.; *d.* Phoenix, Ariz. He was a graduate of the Sheffield Scientific School of Yale, 1862, and the following year joined the United States Geological Survey. For three years he took part in the Californian surveys, embracing the discovery of Mounts Whitney and Tyndall in California. He also determined the age of the gold-bearing rocks, surveyed the Yosemite Valley, and collected evidence pointing to the glacification of the Sierras. His next work was the geological survey of virgin territory, including the fortieth parallel and extending across the Rocky Mountains, according to a plan he devised and sanctioned by Congress. The survey, which was made under the auspices of the army engineers and occupied him from 1867 to 1872, included an examination of the Comstock Lode and of the Eureka and Leadville districts. His report was a valuable contribution to scientific knowledge and guide to the government's further geological researches. In 1879, he was appointed the first director of the U.S. Geological Survey, which he had organized the previous year, but resigned the post, in 1881. Thereafter he followed the profession of a mining engineer, acquiring a large practice, and devoted much study to determining the age of the earth. His publications include *Systematic Geology, 1878.*

KING, HENRY CHURCHILL (1858), college president and theologist; *b.* Hillsdale, Michigan. He graduated from Oberlin, 1879, and also from the Oberlin Theological Seminary, 1882. After studying at Harvard and Berlin, he returned to Oberlin, in 1884, and became identified with the faculty of that college throughout his career, first teaching mathematics and philosophy, then serving successively as professor of philosophy, and of theology, and in 1902, becoming president. Later he lectured in the Orient. His writings relate mainly to theological and religious subjects.

KING, HARRY ANDREWS (1867), an American college pres.; *b.* at Kansas City, Mo.; *s.* of David Clark and Sarah Louise Andrews King. He graduated from Baker University, Kansas, in 1897, and received the degree S.T.B. from Boston University, in 1904. He was ordained a Methodist Episcopal minister in 1897, and was afterwards pastor of several churches, including the Oakley Church, Kansas City, from 1905-7. He was then educational secretary of Baker University until 1909, when he became president of Moores Hill, Ind., College, which position he resigned, in 1915, to become president of Clark University, S. Atlanta, Ga.

KING, HORATIO (1811-1897), former Postmaster General; *b.* Paris, Me.; *d.* Washington, D.C. He became a post office clerk in Washington, in 1839, after being in the printing and publishing business in his native town and in Portland. He was appointed First Assistant Postmaster General, in 1854, and served as Postmaster General between January and March, 1861. He devised the 'penalty envelope' used by the post office department.

KING, RUFUS (1755-1827), U.S. Senator and diplomat; *b.* Scarboro, Me.; *d.* Jamaica, L.I. He graduated from Harvard, in 1771, and became a member of the Massachusetts legislature and of the Continental Congress, taking an active part in the convention, of 1787, which framed the Federal Constitution. Meantime, he removed to New York City; entered the State Assembly, in 1789, and represented the state in the U.S. Senate, where he occupied a distinctive place as a leader of the Federals. President Washington appointed him as Minister to England, in 1796, a post he occupied till 1803. After his return he was twice the Federalist candidate for Vice-President. In 1813 and 1819, the legislature again sent him to the United States Senate, where he served till 1825, when he became Minister to England for the second time.

KING, RUFUS (1814-1876), Civil War general and journalist; *b.* New York City. He graduated from West Point in 1833, but followed civilian pursuits, first as a railroad engineer, then as an editor. He edited the *Albany Advertiser* and the *Evening Journal* between 1839 and 1845; was Adjutant General of New York state; and for sixteen years afterward edited and partly owned the *Sentinel* and *Gazette* of Milwaukee, where he had removed. The Civil War brought him back into the army, and in that conflict he commanded the Iron Brigade, which repulsed two of Jackson's divisions, in 1862, and participated in the second battle of Bull Run. From 1863 to 1867, he was U.S. Minister to Rome, and later deputy collector of customs at New York.

KING, THOMAS STARR (1824-1864), Unitarian pastor and lecturer; *b.* New York City; *d.* San Francisco. He began his career as a clerk and teacher, meantime studying theology. In 1846, he became pastor of a Universalist Church in Charlestown, and, 1848-60, pastor of a Unitarian Church in Boston. He acquired great popularity as a lyceum lecturer while holding these pastorates. Called to San Francisco to take charge of the only Unitarian church there, he was of signal service at the outbreak of the Civil War in resisting and denouncing from lecture platforms the movement in Southern California to secede from the Union and form an independent republic in the state. During the heyday of the American Lyceum he was among its most outstanding figures. A peak of the White Mountains, which he had explored, is named in his honor, and there is a memorial of him in Golden Gate Park, San Francisco. His lectures were published in book form after his death.

KING (WILLIAM BENJAMIN), BASIL (1859), author; *b.* Charlottetown, Prince Edward Island, Canada. He studied at King's College, Windsor, Ont., after a primary education in his native town, and later settled in Cambridge, Mass. He became an author, in 1900, and wrote a number of notable novels, which established his repute as a writer of unusual power in depicting the spiritual vicissitudes of life. His earlier works included *The Inner Shrine*, published anonymously, in 1909, whose long popularity brought him into front rank. Other noteworthy novels are *The Side of the Angles, 1916*; *The High Heart, 1917*; *The Lifted Veil, 1917*; *The City of Comrades*, and *The Abolishing of Death, 1919*; *The Conquest of Fear, 1921*; and *The Discovery of God* and *Dust Flower, 1922*.

KING, WILLIAM HENRY (1864), U.S. Senator and lawyer; *b.* Fillmore City, Utah. He was educated at the Brigham Young Academy and University of Michigan, and afterwards studied law at the University of Michigan, receiving the LL.B. degree, in 1887. He practiced his profession at Fillmore City, and at Provo City, of which he served as city attorney, and was also county attorney of Utah county. He entered public life as a member of the Utah Territorial Legislature, became an associate justice of the State Supreme Court, in 1894, and served for two terms in the U.S. House of Representatives, 1897-9, 1900-1, as a Democrat. In 1916, he was elected to the U.S. Senate for the 1917-23 term, and was re-elected in 1922.

KING, WILLIAM RUFUS (1786-1853), Vice-President of the U.S.A., born in Sampson co., N. Carolina. He was admitted to the bar in 1806 and entered Congress in 1810. He represented Alabama in the Senate from 1820-44, and was minister to France in 1844, and showed himself an active advocate for the annexation of Texas. In 1848, he was again a senator, ultimately becoming president of the Senate, and in 1852, vice-president of the United States.

KING GEORGE'S WAR.—The third intercolonial war between the French and the British, 1744-1748. On May 3, 1744, Governor Duquesne of Cape Breton captured an English settlement on Canso Island near Nova Scotia, wrecking the fort and taking the prisoners to Louisburg. Further attacks on Annapolis, Nova Scotia, and Placentia failed. The British colonial government now prepared an expedition against the Nova Scotia Indians who had attacked Annapolis and were preparing to capture Louisburg. Pennsylvania, New Jersey,

Connecticut, New York, and Rhode Island contributed funds and supplies for the expedition but the chief part was borne by Massachusetts. William Pepperell, in command of 4,000 men, left Boston, in April, 1745, in 100 colonial ships, and a small British flotilla, under Commodore Warren. After making five attacks on the island battery of Louisburg, Nova Scotia, the French surrendered, June 17, 1845. For this victory, William Pepperell was made a baronet. Two other expeditions in the following year failed. By the Treaty of Aix-la-Chapelle, in 1748, Louisburg was returned to France.

KING BIRD, BEE-BIRD, BEE-MARTIN (*Tyrannus carolinensis*), an Amer. Tyrant Flycatcher whose names are due to the boldness with which it attacks birds trespassing near its nest, and to its alleged preference of honey-bees for food.

KING-CRAB (*Limulus*), a peculiar, old-fashioned Arachnoid, entirely covered by large horseshoe-shaped and hexagonal shields. It lives in shallow waters in the W. Pacific and Atlantic Oceans, burrowing in the mud or sand of sheltered bays, and subsisting on worms. Occurs as a fossil from Upper Jurassic times. Forms the order Xiphosura amongst Arthropods.

KINGFISHERS (*Alcedinidæ*), a family of Picarian birds with 200 species scattered all over the world. The *Water-K.* have long, slender bills, frequent streams, and feed on fish; while the *Wood-K.* or *King-Hunters*, have stouter, rounded or compressed bills, inhabit woodlands, and subsist mainly on locusts, crabs, and even reptiles, although a fish meal is not disdained. The *Common K.* (*Alcedo ispida*), the only Brit. native, belongs to the former group.

KINGLETS and **GOLDCRESTS** (*Regulidæ*), a family of minute perching birds occurring in the northern hemisphere. They have straight, sharp beaks and are wren-like in appearance. Brit. examples are the *Firecrest* (*Regulus ignicapillus*) and *Goldcrest* (*R. regulus*).

KING PHILIP'S WAR.—King Philip (*Metacomet*) was the younger *s.* of Massasoit, sachem of the Pokanoks, and succeeded his *bro.* as sachem, in 1762. Like his *f.*, he was at first friendly to the English, but he saw that if they became the ruling power, it meant the destruction of his people. The war grew out of the murder of Sausamon, a former convert of Eliot the apostle by the Indians. King Philip's people claimed that the man had been executed as an informer. Reprisals followed, and King Philip and his people were driven from their lands, he fleeing to the Indians of the interior. The Nipmucks, a strong tribe of central Massachusetts, took the warpath and destroyed 12 towns, burning them and massacreing the inhabitants. Philip took part, or at least was present, at the destruction of Bradford, in 1775, and Lancaster and Bridgewater, 1776. On September 18, 1778, Captain Lathom's company was almost wiped out at Bloody Brook, near Deerfield. The Narragansett Indians defeated Colonel Winslow at Kingston, Rhode Island. The Nipmucks also were again active in works of destruction. But the British gradually overcame resistance and King Philip fled to Mount Hope, where Captain Burch's party hunted down and killed him, August 12, 1776.

KING WILLIAM'S TOWN (32° 48′ S., 27° 30′ E.), town, Cape Province, S. Africa. Pop., 1921, 5,968.

KINGS, I AND II, books of the Bible, containing history of Israel from the end of David's reign, *c.* 1,000 B.C., to 562 B.C., when Jehoiachim was let out of prison in Babylon. The books are obviously made up of older materials. *1 Kings*, chapters 1 to 11, deal with Solomon's nomination as David's successor and his reign; *1 Kings*, 12 to *2 Kings*, 17, with the divided monarchy; and *2 Kings*, 18 to 25, with the Kingdom of Judah. The 'Book of the Acts of Solomon' and the 'Book of the Chronicles of the Kings of Israel' (that of Judah) are referred to as sources. Many of the narratives are very brief, summarizing political events and are probably taken from official sources; others, which are longer, relate stories of the prophets, and are probably from independent sources. As there is much about the Temple, it is possible that special Temple documents were procured by the author. Driver thinks he can distinguish a pre-Deuteronomic framework of *1 Kings* 1 to 11 which describes the splendors of Solomon's reign, with other portions and less favorable details added by a Deuteronomic editor. Likewise the history of the two kingdoms has different strata, the stories of Elijah and Elisha are an important insertion, and may not themselves all come from the same source. They are among the most striking chapters of the Old Testament. *2 Kings* 18 to 25, dealing with the Southern Kingdom, begins with King Hezekiah. Some passages are the same as those in Isaiah. *1* and *2 Kings* were perhaps put together about 600 B. C.; a few passages which seem to refer to the Exile may have been added afterwards.

KING'S BENCH, COURT OF, England, so called because in former times

frequently the king sat there in person. It is presided over by the Lord Chief Justice and 14 puisne judges, who go on circuit through the county towns of England and Wales holding assizes for the trial of civil and criminal cases. The powers of the court are very great, and include the hearing of actions for writs of certiorari, prohibition, mandamus, and Habeas Corpus.

KING'S COLLEGE, LONDON, is a college of the London University which was founded in 1828, its constitution being amended by an Act of parliament in 1882. It is situated in the Strand, and affords instruction in theology, literature, science, engineering, and medicine for men students over the age of sixteen; but there is also a civil service department and an art school. Its library has over 30,000 vols., chiefly of a scientific character, and the museum contains King George III.'s collection of philosophical instruments and mechanical models, as well as Babbage's calculating machine. In connection with the college is a branch for the higher education of women, and a school for boys. The latter and the hospital are shortly to be moved to South London.

KING'S COUNSEL, in England and Ireland a barrister app. by letters-patent. K. C's do not accept pleading or conveyancing, but in court they are the leaders. Colonial K. C's are app. by Brit. Lord Chancellor.

KING'S COUNTY, (53° 10′ N., 7° 30′ W.); inland co., Leinster, Ireland surface generally level, with Bog of Allen in center, Slieve Bloom Mts. in S.; drained by Shannon, Brosna, Barrow, Boyne; crossed by Grand Canal; cereals, dairy farming, live stock. Area, 770 sq. m.; pop. 56,700.

KING'S EVIL, old term applied to scrofula, a condition usually of childhood manifested by enlargement and cheesy degeneration of the lymphatic glands, especially of the neck, with a tendency to chronic inflammation elsewhere, so named because of a popular belief that it could be cured by the royal touch. The sovereigns of France and of England were alone believed to have this power, James II. being the last English king to touch, but the practice was continued by his descendants, James, the Old Pretender, and his sons Charles (the Young Pretender) and Henry, also by Queen Anne.

KINGSLEY, CHARLES (1819-75), Eng. clergyman and novelist; *b.* Dartmoor, Devon; *ed.* Cambridge; became rector of Eversley, Hampshire, 1844. Pub. *Andromeda and other Poems*, 1858; which included some excellent songs and ballads. His first novels, *Alton Locke* and *Yeast*, show K.'s 'Christian Socialism.' His romances and novels, *Hypatia*, *Westward Ho!*, *Two Years Ago*, *At Last*, and the inimitable *Water Babies*, are famous.

KINGSLEY, DARWIN PEARR (1857), a life underwriter; *b.* at Alburg, Vt., *s.* of H. P. and Celia P. La Due Kingsley. He was educated at the University of Vermont. He was a delegate to Republican National Convention in 1884, was state auditor of Colorado from 1887-8 and in addition to being a director of the Chemical National Bank and the New York Trust Co., and a trustee of the University of Vermont, he was vice-president from 1898-1907 and president from 1907 of the New York Life Insurance Co. He was also at one time president New York Chamber of Commerce.

KINGLSEY, MARY HENRIETTA (1862-1900), Eng. author; niece of Charles; travelled in Africa and wrote *The Story of W. Africa*; *d.* while nurse in S. African War.

KING'S LYNN, Lynn Regis (52° 46′ N., 0° 24′ E.), port, Norfolk, England; has remains of Franciscan friary, XII.-cent. church dedicated to St. Margaret, and XIV.-cent. chapel of St. Nicholas; large harbor; exports coal, oil-seed, shrimps; chief industries are fishing, iron-founding, brewing. Pop. 1921, 19,968.

KING'S MOUNTAIN, an elevation in York co., South Carolina, famous as the scene of a battle between the Americans and the British on October 7, 1780. It was one of the most notable and fiercely fought battles of the Revolution. The British were defeated with a loss of over 450 killed and 650 prisoners. The Americans were led by several mountaineers, including Sevier, Shelby and Campbell, and the British were commanded by Colonel Ferguson.

KINGSTON, a city of Canada, in the province of Ontario, in Frontenac co. It is at the head of Lake Ontario, 160 miles north of Toronto. The city has excellent railway facilities and good water communications by way of the lake, the St. Lawrence river, and the Rideau Canal. It has a large safe harbor. Its industries include shipbuilding and the manufacture of locomotives, engines, leather, boots and shoes, and agricultural implements. It is the seat of the Royal Military College of Canada, Queen's University, Royal College of Physicians and Surgeons, and Women's Medical College. There is also a business college and a training institute for teachers. Kingston is the seat of an Anglican bishop and a Roman Catholic archbishop. The site

was formerly occupied by the old French fort Frontenac. From 1841 to 1844 Kingston was the capital of Canada. Pop. about 25,000.

KINGSTON, a city of New York; County Seat of Ulster co., on the Hudson river. Its chief industry is the manufacture of tobacco and cigars; boat-building, cement works, brickyards, are other industries, and stone is quarried in the neighborhood. Pop. 1920 26,688.

KINGSTON, a borough of Pennsylvania, in Luzerne co. It is on the Lackawanna and Lehigh Valley railroad, and on the Susquehanna river. Although it is chiefly a residential place it has important industries, including the manufacture of adding machines and hosiery. In the neighborhood are important coal mines. Pop. 1920, 8,952.

KINGSTON, a seaport and the capital of Jamaica, West Indies, situated in the southeast of the island in the county of Surrey. A disastrous earthquake occured in January 1907, when nearly 2,000 lives were lost. Pop. 40,000.

KINGSTON, ELIZABETH, DUCHESS OF (1720-88), notorious for scandalous life; bigamously m. 2nd Duke of Kingston, 1769; tried at suit of his nephew and declared guilty, 1776.

KINGSTON, MORGAN (1889), an operatic tenor, *b.* at Staffordshire, Eng., *s.* of John and Jane Williams Kingston. Educated in High School, and studied music under Evelyn Hatteras, London. He made his debut as a singer under the auspices of the National Sunday League at Queen's Hall, London in 1910 and was tenor soloist at the Wagner Centenary Festival, Albert Hall, London in 1912. He made his American debut as Radames, in "*Aida*", with the Century Opera Co., in 1913, and was with the Chicago Opera Co., during 1916-17 after which he was connected with the Metropolitan Opera Co.

KINGSTON-ON-THAMES (51° 25′ N., 0° 18′ W.), municipal borough, Surrey; has XIV.-cent. church, near which ancient royal chapel formerly stood. Pop. 1921, 39,484.

KINGSTOWN (53° 17′ N.; 6° 8′ W.), town, Dublin, Ireland; mail packet station. Pop. 18,000.

KING-TE-CHEN (29° 7′ N.; 117° 31′ E.), town, China; noted for manufacture of porcelain. Pop. *c.* 1,000,000.

KIN-KIANG FU (29° 40′ N., 116° E.), town, Kiang-si, China; treaty port. Pop. 36,000.

KINO, drug consisting of the juice obtained from incisions in the trunk of a tree, *Pterocarpus marsupium*, of natural order *Leguminosæ*, growing in West Africa and the East Indies; obtained commercially in the form of angular, glistening, reddish-black, brittle fragments; inodorous, soluble in alcohol and boiling water. The chief constituent is kino-tannic acid. Used medicinally, being a powerful astringent, in gargles and diarrhœa mixtures.

KINROSS-SHIRE (56° 13′ N.; 3° 28′ W.), county, Scotland; area, 82 sq. miles; surface consists of hills encircling central plain in which is Loch Leven; watered by Leven R.; chief industry, agriculture; produces barley; sheep and cattle raised. County town, Kinross. Pop. 1921, 7,963.

KINSOLVING, GEORGE HERBERT (1849), a bishop, *b.* at Bedford co., Va., *s.* of Rev. Ovid A. and Julia Heiskell Krauth Kinsolving. He was educated at the University of Virginia and P. E. Theological Seminary, Va. He became a deacon in 1874 and the following year a priest of the Protestant Episcopal Church, and was asst. at Christ's Church, Baltimore during 1874-5, after which he was rector of St. Mark's, Baltimore, then of St. Johns, Cincinnati and of the Church of the Epiphany, Phila., from 1881-92. He was elected asst. bishop of Texas in 1892 and succeeded late Bishop Gregg as bishop of Texas in 1893.

KINSTON, a city of North Carolina, in Lenoir co., of which it is the county seat. It is on several important railroads and on the Neuse river. It is an important commercial city and has manufactures of hosiery, yarn, silk and lumber. Pop. 1920, 9,771.

KIOSK, a Turkish word signifying an open pavilion or summer house.

KIOTO, or KY-OTO, an important city of Japan, 329 m. from Tokyo. It was founded in 793, and was from that time until the revolution of 1868 the capital of the Japanese empire. Consequently it contains many interesting buildings, among which are the Mikado's Palace, a large mass of buildings covering an area of 26 acres; the Doshisha, a Christian university under the auspices of the American Board Mission; the Imperial University, founded in 1875; the Kitano Tenjin, a temple dedicated to Tenjin Sama, which contains the thirty-six genii of poetry (the usual adornment of Shinto temples); and the San-ju-san-gen-do, the temple of the 3333 images of Kwannon, the goddess of mercy, founded in 1132, the grounds of which contain the Daibutsu, or Great Buddha, and a fine art museum. Bleaching and dyeing are successfully carried on, for K. abounds in clear water, and

the city is noted for its manufactures of silk, brocades, embroidery, velvet, porcelain, bronze, and other artistic products. Pop. 1919, 591,305 .

KIPLING, RUDYARD (1865), Eng. poet and novelist; *b.* Bombay; educated at the United Service Coll., Westward Ho, England; made use of his experiences there in his *Stalky and Co.*, a tale of schoolboy life; went to Lahore as sub-editor of the *Civil and Military Gazette* 1882, and remained in India till 1889; subsequently travelled extensively before settling down in England; is a voluminous writer, hardly a year passing since the appearance of *Plain Tales from the Hills* without its volume either of prose or verse; in quick succession appeared *Soldiers Three, The Story of the Gadsbys, In Black and White, Under the Deodars, Wee Willie Winkie*, and *The Phantom 'Rickshaw*, and these almost immediately gave Kipling his place among the world's great short-story writers. Other books that have appeared since are *The Light that Failed, 1891*; *Barrack-room Ballads, 1892*; *Many Inventions, 1893*; *The Jungle Book, 1894*; *The Second Jungle Book, 1895*; *The Seven Seas, 1896*; *Captains Courageous, 1897*; *Puck of Pook's Hill, 1906*; *Actions and Reactions, 1909*; *A Diversity of Creatures, 1917*; and *Letters of Travel, 1920*. Kipling has greatly extended the bounds of literary art by the introduction of strange experiences and new types of character and of novel forms of presentation; perhaps his chief characteristic is his versatility, his subjects ranging from animals and children to the sophisticated products of modern society, and from native life in India to slum life in London; he shows an absolute command of style and all its resources. As a poet, his mastery of versification is complete, and few modern poets have so well caught the ballad note. Awarded the Nobel Prize for literature in 1907.

KIPPER, popular term for herring cured by smoke-drying the split fish; origin of word apparently 'kip,' cartilaginous beak developed by male salmon.

KIRBY, WILLIAM FOSGATE (1867), jurist; *b.* Miller County, Arkansas. After a public school education he studied law and received the degree of LL. B. of Cumberland University, Tenn., in 1889, meanwhile opening a practice in Texarkana in 1885. He served in the Arkansas legislature from 1893 to 1901, compiled a digest of State laws, became Attorney General, and was associate justice of the Arkansas Supreme Court from 1910 to 1918. He resigned from the bench to fill an unexpired term in the U. S. Senate of which he was a member till 1921.

KIRCHHEIM-UNTER-TECK (48° 39′ N., 9° 28′ E.), town, Württemburg, Germany. Pop. 10,000.

KIRCHWEY, GEORGE WASHINGTON (1855), an American lawyer and penologist, *b.* at Detroit, Mich., *s.* of Michael and Maria Anna Lutz Kirchwey. He graduated from Yale in 1879. He was admitted to the bar in 1882 and was engaged in the general practice of law at Albany for 10 years. He was dean of Albany Law School from 1889-91 after which he was professor of law at Columbia University until 1916. He was also warden of Sing Sing Prison during 1915-16 and was made head of the dept. of criminology of the New York School of Social Work in 1917. He was a contributor to legal and other periodicals.

KIRGHIZ, a nomadic people of Tatar-Mongolian race, who inhabit the steppes of Asia between Ural and Altai Mountains; they number about 3,000,000, speak a Turk, dialect, and, though professing Muhammadanism, still retain many heathen customs; generally subdivided into two groups, the K. Kazaks and the Kara-K. The KAZAKS are found in Ural and other provinces of Russia; they number over 2,500,000, and have been under Russ. control since 1819. The KARA-K. (Black K.) inhabit the uplands of Pamir and Turkestan, and other regions in Central Asia; their numbers are variously estimated at from 350,000 to 800,000; and they also are subject to Russia.

KIRIN (43° 52′ N., 126° 53′ E.), town, K. province, Manchuria. Pop. *c.* 100,000. K. province has area, 105,000 sq. miles. Pop. 6,000,000.

KIRK, ELLEN WARNER (1842), an American writer; *b.* in Southington, Conn. She married in 1879, John Foster Kirk. Her books include: *Love and Idleness, A Lesson in Love*, etc.

KIRK, JOHN FOSTER (1824-1904), historian and editor; *b.* Fredericton, New Brunswick. He studied at Halifax and Quebec, and served as secretary to the historian, W. H. Prescott from 1847 to 1859, accompanying him in his travels. He was a frequent contributor to current periodicals of opinion and edited Lippincott's Magazine from 1870 to 1886. He lectured also on European history at the University of Pennsylvania. His writings include a History of Charles the Bold (3 vols.).

KIRKCALDY (56° 7′ N., 3° 9′ W.), town, Fifeshire, Scotland; has small harbor; great linoleum and floorcloth industries, breweries, linen manufactures; was Adam Smith's birthplace; called the

'Lang Toun' from its great length. Pop. 1921, 39,951.

KIRKCALDY, SIR WILLIAM KIRKCALDY OF GRANGE (*d.* 1573), one of Scot. 'Lords of the Congregation'; party to murder of Cardinal Beaton, 1546; led opposition to Mary, Queen of Scots; but upheld her cause after her imprisonment; executed.

KIRKCUDBRIGHT (54° 50′ N., 4° 2′ W.), town, Scotland; royal burgh since 1455; has ruined castle; finest harbor in S. Scotland. Pop. 1921, 2,101.

KIRKCUDBRIGHTSHIRE (55° N., 4′ W.), maritime county, S. W. Scotland, with rocky coast; surface hilly, rising in N. W. to over 2,760 ft. in Mt. Merrick; drained by Dee, Fleet, Ken, Urr; area, *c.* 900 sq. miles. Chief towns, Kirkcudbright, Maxwelltown, Dalbeattie, Castle-Douglas. Great part of surface is under grass; cattle, sheep, horses raised; dairy-farming carried on; large quantities of granite quarried. Monastic ruins include Dundrennan, Lincluden. K. was frequently overrun by Danes and Saxons in X. and XI. cent's, and in later times was scene of hostilities between Scots and English, and of private feuds between great Border families. Pop. 1921, 37,156.

KIRK-KILISSEH, tn., Thrace, (41° 44′ N., 27° 14′ E.); is chief trading station between Constantinople and the Balkans; butter, cheese, wine, tobacco, and cereals. During Balkan War, after Bulgarians had driven Turks back from lines N. of Adrianople, Kirk-Kilisseh was on extreme right of Turk. new line; captured by Bulgarians in Oct. 1912. After World War town was ceded to Greece, 1920, but was restored to Turkey in 1923. Pop. 1920, 16,263.

KIRKSVILLE, a city of Missouri, the county seat of Adair co. It is on the Wabash, and the Quincy, Omaha and Kansas City railroads. The surrounding country is an important agricultural and coal mining area. The city's chief industry is the manufacture of shoes. It is the seat of the State Normal School and the public buildings include a courthouse and government buildings. Pop. 1920, 7,213.

KIRKWALL (58° 59′ N., 2° 57′ W.), capital, Orkney, Scotland; cruciform cathedral, chiefly Norman, dedicated to St. Magnus, dates from XII. cent.; ruined episcopal and baronial palaces; royal burgh since 1486; shipping, distilling, fishing. Pop. 4,000.

KIR-SHEHR (39° 10′ N., 33° 59′ E.), town, Asia Minor. Pop. 10,000.

KIRWAN, RICHARD (1733-1812), Irish scientist; *b.* Cloughballymore; pres., Royal Irish Academy, 1791; wrote on chemistry, geology, magnetism, meteorology, philology.

KISFALUDY, KAROLY (1788-1830); Hungarian author; *b.* at Téte; composed his tragedy *Gyilkos* (The Murder), *1808*; and martial poems; wrote *Klára Zách*, a tradegy, *1812*. The composition of three plays, *Ilka*, *Voivode Stiber*, and *The Petitioners*, placed him first among Hungarian writers. In 1822 he founded the *Aurora*, the pioneer journal of Hungarian romanticism.

KISH, KENN; KEISH (26° 32′ N.; 54° E.), island, Persian Gulf; pearl-fisheries.

KISHANGARH (1) (26° 20′ N.; 75° E.), native state, Rajputana, India. Pop. 1911, 87,093. (2) (26° 33′ N., 74° 54′ E.), town, capital of above. Pop. 13,000.

KISHINEV (47° N., 28° 52′ E.), town, Bessarabia; archiepiscopal see; cathedral. Pop. 118,000.

KISHM (1) (26° 45′ N.; 55° 50′ E.); island, Persian Gulf; area, *c.* 500 sq. miles; salt, sulphur. Pop. *c.* 18,000. (2) (26° 58′ N., 56° 28′ E.), chief town. Pop. *c.* 5,000.

KISKUNFÉLEGYHÁZA (46° 44′ N.; 19° 50′ E.), town, Hungary; railway centre. Pop. 35,000.

KISMET, Mohammadan word for 'fate'.

KISS, token of salutation or, more frequently, affection, used since earliest times.

KISSINGEN (50° 12′ N.; 10° 4′ E.); town, Bavaria; spa; mineral springs. Pop. 5,500.

KISTNA, KRISHNA (*c.* 16° 10′ N.; 81° 10′ E.), district, Madras, India; watered by K. and other rivers; produces cereals, tobacco, cotton; chief town, Masulipatam. Pop. *c.* 1,748,000.

KISTNA, KRISHNA (15° 57′ N., 81° 8′ E.), river, S. India; source in W. Ghats; enters Bay of Bengal.

KITCHENER, a city of Ontario, formerly known as Berlin. It is an important industrial city and manufactures furniture, rubber goods, foundry products, etc. Pop. about 25,000.

KITCHENER OF KHARTUM, HORATIO HERBERT, EARL (1850-1916), Brit. soldier and administrator, *b.* at Crotter House, Ballylongford, Ireland, second son of Lieut.-colonel Henry Horatio Kitchener and Anne Frances Chevalier, of E.

Anglian stock on his mother's side, with slight Fr. admixture; educated in France; entered Military Academy at Woolwich in 1868, but gave no promise of future distinction; during Franco-Prussian War served with Chanzy's army for short time; pneumonia induced by ballooning nearly killed him; delicate as a young man. Left Woolwich in 1871 with commission in Royal Engineers. His friend Condor, of the Palestine Exploration Fund, suggested that he should fill a vacancy on the survey party's staff, and thus began his connection with the East. In Palestine, 1874-8, he surveyed, made maps, saved Condor's life twice, and laid the foundation of that Eastern lore which made him invaluable as an intelligence officer in Egypt. After survey work in Cyprus, 1878-82, received cavalry command in Egyptian army; took part in Nile Expedition, 1884-5, for relief of Gordon; was governor-general of Red Sea littoral, and commandant of Suakin, 1886-8; severely wounded in attack on Handub, 1888. In command of a brigade of Sudanese, he participated in actions at Gamaizieh, 1888, and Toski 1889; in temporary command of Egyptian police, 1890-1, and in following year succeeded Lord Grenfell as sirdar (commander-in-chief) of Egyptian army. His great feat as sirdar was the re-conquest of the Sudan, which culminated in 1898 when, at the Atbara, April 8, and Omdurman, Sept. 2, he routed the dervishes and completely destroyed the power of Mahdism. His tactics at Omdurman were severely criticized, and in none of his campaigns did he show high genius as a commander in the field. For his services in recovering the Sudan he was cr. a peer, thanked by Parliament, and awarded the sum of $150,000.

In the *Fashoda Affair* (Sept. 1898), he showed himself a diplomat of real ability. Throughout his life he made remarkably few mistakes in dealing with men. He had a zeal for economy, and his Sudan campaign was conducted at a cost less than the estimate.

In the course of the South African War, 1900, he was made chief of staff to Lord Roberts, whom he later succeeded as commander-in-chief of the South African forces. His tactics at Paardeberg were again severly criticized, and there is very little evidence that the result could not have been achieved by a bombardment, as Cronje was already surrounded. His work during the last two years of the war, when he demoralized the organized guerrilla warfare of the Boers by a system of blockhouses and 'drives,' deserved high praise. On the termination of hostilities, 1902, he was made a viscount and received the thanks of Parliament, with a grant of $250,000.

In the same year he was appointed commander-in-chief in India, where he remained for seven years engaged in the work of reorganizing the army. His conflict with Lord Curzon, the viceroy, led to the latter's resignation. Promoted field-marshal in 1909. After a brief visit to America in 1910, he was appointed consul-general of Egypt, 1911. He was at Dover, on his way back to Egypt, when the crisis arose which culminated in the World War. At once his name sprang to men's lips as the ideal secretary for war, to which post he was appointed. To the mass of the people he was the greatest and most successful of all living generals. The greatest achievement of his life was the raising and equipping of 5,000,000 troops by the magic of his name.

His hurried visit to France on Sept. 1, 1916, during the retreat from Mons, in order to prevent Lord French from undertaking a movement independent of the Fr. army, was thoroughly justified by the result of the battle of the Marne.

Controversy has also arisen in reference to his policy with regard to the Dardanelles; he is accused by some of being too favorable to the campaign, and by others of spoiling its success by slowness in providing the necessary troops.

On Monday, June 5, 1916, he and his staff embarked on the armored cruiser *Hampshire* for the purpose of proceeding to Russia to consult with the chiefs of the Russian army in regard to a projected combined offensive in East and West. The *Hampshire* was sunk by a mine and Kitchener and many officers with him were lost.

KITCHIN, CLAUDE (1869-1923), lawyer; *b.* Scotland Neck, N. C. He studied law and was admitted to the bar in 1890 after graduating from Wake Forest College, and practised his profession in his native town. From 1911 to 1921 he was a Democratic member of the U. S. House of Representatives from North Carolina, and in the latter part of his tenure was majority leader.

KITE, a member of the HAWK FAMILY.

KITE-BALLOONS, captive balloons used in military operations for directing artillery fire and observation; observer, in telephonic communication with the artillery commanders in the vicinity, inspects enemy positions with aid of powerful glasses and telescopes, notes movement of bodies of troops, and indicates suitable targets; when firing begins may signal results and thus ensure accuracy of fire; this work, however, is usually performed by 'forward observer,' similarly

in telephonic communications with his battery. Spherical type of captive balloon has given place to an elongated type, called by soldiers 'sausage' or *drachen* (Germ. for 'kite'); the elongated type has much greater steadiness in winds, pressure of moving air against under side of balloon holding it steady in same manner as ordinary kite (hence the name). Kite-balloon is fitted with tails consisting of several conical canvas cups to assist in maintaining stability. 'Caquou' balloons (so called from name of inventor) have stream-line shape and fins, instead of kite-tail cups. Altitude of observation balloons depends on atmospheric conditions and distance of enemy's artillery; are drawn down every few hours to change observers (usually two); steel wires of holding cable serve to complete electric circuit for telephones. Most modern type of windlass for holding captive balloons consists of winding drum carried on a motor. In case balloons should be fired by bombs or bullets of aviators, observers have means of escape by descending in PARACHUTE attached to the body by means of harness.

KITE-FLYING is largely practised as pastime by Chinese and Japanese; since the middle of XVIII. cent. has been used in Britain for scientific and later for military purposes. Franklin extracted electricity from clouds by this means in 1752; now used for measuring force of wind, barometric pressure, temperature, etc. Box kites have now superseded older patterns. Military kites are used for reconnaissance or photographing strategical positions.

KITTATINNY, or BLUE MOUNTAINS, a mountain ridge of Pennsylvania and New Jersey, U. S. A., forming part of the Appalachian system. It is famous for its picturesque scenery, and includes the celebrated Delaware Water Gap. Alt. 1,200 ft. to 1,800 ft.

KIUNG CHOW, a city of Japan, on the island of Formosa. It is an important seaport. Pop. about 50,000.

KIUSHIU, KIUSIU, or KIMO, the most southerly of the three principal islands of Japan, in the Pacific Ocean, separated from Korea by the Strait of Korea, and from Honshiu (Hondo) Island by the Strait of Shikoku. It has an area (including small adjacent islands) of 16,840 sq. m., and is mountainious, though not remarkable for lofty peaks. Aso-tuke, an active volcano, has the largest crater in the world. The island is subject to earthquakes on the Pacific coast, and has a varied climate, the summers are hot and winters very cold, the months of July and August being especially marked by the oppressive heat at sea-level. The occurrence of the rice famine in 1869 in K., when the people perished from hunger on account of the lack of transport facilities, was largely responsible for the introduction of a railway system into Japan. A line now runs from Moji in the N. to Kagoshima in the S., a distance of 233 m., and another from Moji to Nagasaki, 164 m. Coal is found in the island, copper also is mined, and rice, wheat, beans, tea, and tobacco are grown. Pop. 7,500,000.

KIUSTENDIL, KÖSTENDIL, KUSTENDIL (43° 42′ N., 23° 24′ E.), town, Bulgaria; thermal springs. Pop. 1920, 15,086.

KIZIL IRMAK (41° 42′ N., 46° E.), river, Asia Minor; enters Black Sea.

KIZLYAR (43° 46′ N., 46° 44′ E.), town, Terek, Russia; textiles, wine. Pop. 8,000.

KLADNO (50° 8′ N., 14° 7′ E.), town, Czecho Slovakia; coal, iron, steel. Pop. 1921, 19,104.

KLAGENFURT (46° 37′ N., 14° 19′ E.), town, Austria; cathedral, episcopal palace. Pop. 1920, 26,147.

KLEBER, JEAN-BAPTISTE (1753-1800), Fr. general; served with distinction at Fleurus, 1794, and in Vendean, Egyptian, and Syrian campaigns; won battles of Mount Tabor and Heliopolis in Syria, 1799; assassinated.

KLEIST, HEINRICH BERNT WILHELM VON (1777-1811), Ger. dramatist; *b.* Frankfort-on-Oder; after unhappy life shot himself near Berlin; best works, *Prinz Friedrich von Homburg*, *Die Hermannschlacht* (dramas), *Der Zerbrochene Krug* (comedy), *Michael Kohlhaas* (romance).

KLEPTOMANIA, stealing by insane person; term generally used in relation to rich people with a weakness for purloining shop goods, etc., they could easily buy.

KLONDIKE, THE A gold bearing stream in Alaska that flows into the Yukon. The name however has been popularly applied to the entire territory on and near the river where gold has been found. As early as 1862 gold was discovered in this region and in 1875 one Juneau, a Frenchman, made a strike at Gold Creek which afterwards was the site of the town that bears his name. Other rich finds were made in 1884 and 1886. On August 16, 1896, George Carmack who came from Illinois in 1890, made a gold strike on Bonaza Creek and

in 1897 the gold rush began, and between 30,000 and 40,000 persons entered the region within two years. Dawson City contained one hut in September 1896 and in 1901 the population was over 9,000. In 1911 it had dropped to about 3,000. Situated near the arctic circle the Klondike region is frozen seven months in the year, when mining is well nigh impossible. Of the gold production of the field The Eldorado, four miles long, has produced $25,000,000. In the best year $22,000,000 was taken from the entire field.

KLOPSTOCK, GOTTLIEB FRIEDRICH (1724-1803), Ger. poet; *b.* Quedlinburg; studied theology at Jena and Leipzig; lived in Copenhagen, 1751-70; *d.* Hamburg; K. was the first genuine Ger. poet of XVIII. cent.; aimed at giving the Ger. nation a Christian epic, viz. *Der Messias* (20 cantos pub. in 4 vols.); wrote numerous odes, lyric poetry, and several dramas.

KLUCK, ALEXANDER H. R. VON (1846), Ger. soldier, of middle-class origin; was ennobled after obtaining colonelcy; colonel-general of the army; fought as lieutenant in Franco-Prussian War; during World War commanded 1st Army which formed the right of the German front advancing upon Paris and the Marne valley. This army fought with Allies at Mons, Landrecies, Solesmes, Le Cateau, Néry, Crépy, Villers-Cotterets, and pursued it, at a distance, almost to the gates of Paris (see MONS, and MARNE). He seems, in spite of his great superiority in aeroplanes and cavalry, to have had very little accurate knowledge of the strength and whereabouts of the Allies. He makes no excuse for getting in front of the 2nd Army when ordered to move in echelon behind it. He retired in Oct. 1916.

KNAPP, MARTIN AUGUSTINE (1843), judge; *b.* Spofford, N. Y. He was admitted to the New York bar in 1869 following his graduation from Wesleyan University, Conn., and pursued his profession at Syracuse, of which he was city attorney from 1877 to 1883. President Harrison appointed him a member of the Interstate Commerce Commission in 1891 and he became its chairman in 1898. Meantime he also served as mediator under the Erdman Act in the settlement of many railroad labor disputes. In 1910 he was appointed presiding judge of the U. S. Commerce Court as a member of the Circuit Court of Appeals, serving until 1913, when the Commerce Court was abolished. Thereafter he served as a circuit judge of the 4th Judicial District. While head of the Commerce Court he continued to act as a mediator on railroad labor questions, and later as a member of a board of mediation created by legislation which superseded the Erdman law.

KNARESBOROUGH (54° 1′ N.; 1° 28′ W.), town, Yorkshire, England; has ruined castle; behind Dropping Well is Mother Shipton's Cave; St. Robert's Cave was where Eugene Aram murdered Clarke. Pop. 5,500.

KNEE, see SKELETON.

KNEISEL, FRANZ (1865), a violinist; *b.* in Rumania, of German parentage, *s.* of Martin and Victoria Lukas Kneisel. He received violin instruction under Grun and Hellmesberger, Vienna, and graduated from the Vienna Conservatory in 1882. After being concertmaster of the Hofberg Theatre Orchestra, Vienna, and of Bilse's Orchestra, Berlin, he came to America in 1885 to become the conductor of the Boston Symphony Orchestra, with which he remained until 1903. In 1905 he became head of the violin and string instrument department of the Institute of Musical Art, New York. Composer: *Advanced Studies for the Violin, 1910.*

KNELLER, SIR GODFREY (1648-1723), portrait painter; *b.* Lübeck; studied under Rembrandt, became Court painter to Charles II. of England, and died famous enough to have a monument in Westminster Abbey.

KNICKERBOCKER, Dutch family settled in New York since end of XVII. cent. See also IRVING, WASHINGTON.

KNIGHT, ALBION WILLIAMSON (1859), a bishop; *b.* at White Springs, Fla., *s.* of George Augustine and Martha Demere Knight. He was educated at the University of the South, Sewanee, Tenn. He was made a deacon in 1881 and a priest in 1883 of the Protestant Episcopal Church after which he served at Palatka and Jacksonville, Fla. He was dean of the Cathedral, Atlanta, Ga., from 1893 until 1904 when he was consecrated a bishop. He was missionary bishop of Cuba, 1904-13 and bishop in charge of the Panama Canal Zone from 1908-20, and was also chancellor of the University of the South from 1913.

KNIGHT, AUSTIN MELVIN (1854), rear admiral; *b.* Ware, Mass. He graduated from Annapolis in 1873, joined the navy as an ensign the following year, and passed through the regular grades of promotion, rising to rear admiral in 1911. After serving on the Pacific, Asiatic, European and Atlantic stations he had charge of the Minneapolis ordnance proving ground from 1885 to 1889. Later he took part in the blockade of Cuba

and the Porto Rican expedition during the Spanish-American war. Between his assignments at stations at home and abroad he served at the Naval Academy. From 1907 to 1909 he commanded the *Washington* and was later commandant of the Narragansett Bay Station. He was president of the Naval War College from 1913 to 1917, and in the latter year was appointed commander-in-chief of the Asiatic squadron, ranking as admiral.

KNIGHTHOOD, existing orders of k. in Great Britain are: (1) the most noble *Order of the Garter*, instituted by Edward III., *c.* 1348; tradition connecting its origin with a Countess of Salisbury is now discredited; consists of Sovereign, Prince of Wales, twenty-five knight-companions. Insignia consists of *Star, Collar, and George* (figure of St. George slaying the dragon), and *Garter*. (2) The most ancient and most noble *Order of the Thistle*, revived by James II., 1687, and after a period of desuetude re-established by Queen Anne, 1703; consists of Sovereign, princes of the blood, and sixteen knights, who are generally peers. The chapel of the Order, in St. Giles' Cathedral, Edinburgh, was opened by King George V. in 1911. (3) The most illustrious *Order of St. Patrick*, instituted by George III., 1783; consists of Sovereign, Grand Master, and twenty-two knights. (4) The most honorable *Order of the Bath*, founded in 1399, revived in 1725, enlarged in 1815, 1847, and on other occasions. (5) The most exalted *Order of the Star of India*, founded by Queen Victoria, 1861, and enlarged in 1866 and 1876. (6) The most distinguished *Order of St. Michael and St. George*, founded in 1818; extended in 1868. (7) The most eminent *Order of the Indian Empire*, founded in 1878; in three classes; officers are Registrar and Secretary; ribbon, purple. (8) The *Royal Victorian Order*, founded 1896.

Among European orders the most illustrious is the *Toison d'Or* or *Golden Fleece* of Spain and Austria, established in 1429 by Philip of Burgundy; other important continental orders are: the *Order of Christ*, a papal order established by pope, John XXII., and Denis I. of Portugal in early XIV. cent.; the *Legion of Honor*, a Fr. order of Napoleon's foundation in 1802; the Prussian *Order of the Black Cross*, established by Frederick I. in 1701; the Bavarian *Order of St. Hubert*, instituted in 1444; the Russ. *Order of St. Andrew*, of Peter the Great's foundation in 1698; and the Ital. *Order of the Annunziata*, which dates from 1362. There are many others, of more or less importance. Orders also exist in many eastern countries, such as Persia, Japan, Siam, and in some of the states of the western world.

The origin of knighthood is veiled in obscurity; the word knight is derived from the Anglo-Saxon *cniht*, a youth or attendant, with which the Ger. *Knecht* may be compared; it afterwards came to be the equivalent of the Ger. *Ritter* and the Fr. *chevalier*, so that the term knighthood is practically identical with the term chivalry, though in general the former is taken to denote the estate itself, and the latter, the principles and usages of the upper classes in mediæval times. The institution of k. may perhaps be traced to the Gallic and Teutonic peoples who inhabited Western Europe from prehistoric times, and who established a distinction between the noble and gentle classes and the rest of the world.

K. in England developed later than on the Continent, and lines somewhat different from those prevailing elsewhere. Except that King Alfred is said to have knighted his grandson Athelstan, there is little or no evidence of the institution in this country before the time of the Norman Conquest, although some writers are of the opinion that it may have been among the Norman customs introduced by Edward the Confessor; at all events its development as a feudal institution, a part of military system, and a class in the social hierarchy, dates from Norman times. Under the system of feudalism (*q. v.*) established by William the Conqueror the king or overlord had power to compel every one who held a knight's fee to become a knight and perform a certain fixed amount of military service; these services were at a later date commuted for money payments, a custom which eventually developed into the levying of a war tax called *scutage*. A later custom, whereby subjects were allowed to compound by money payments for refusing the honor of knighthood, led to many abuses and ultimately resulted in the abolition of knight service after the Restoration of 1660.

Simple knighthood now exists only in England, where it is still conferred by the accolade, the recipients being known as *knights bachelor*. In former times the degree of *knight banneret* might be conferred upon any one who performed an act of valor during battle; but it is generally considered that this degree fell into disuse soon after the middle of the XVI. cent.

KNIGHT-SERVICE, system of land tenure in feudal times. Land was divided into knight's fees, for each of which one armed knight had to be provided by holder of fee to serve forty days in the field when summoned. Holder of

knight's fee was also subject to obligations of relief, wardship, marriage, and feudal aids.

KNIGHTS OF COLUMBUS, Roman Catholic fraternal and benefit organization established in 1882. Those eligible to membership are male Catholics, whose priests testify that they practise their religion. To participate in the insurance features, members must be between 18 and 50; fraternal members may be of any age upward of 21. The limit of insurance is $3,000 and the regulations are those observed by the most experienced and conservative insurance companies. Over $150,000,000 of insurance is in force.

Apart from its benefit features the organization is one of the most powerful and vigorous of those engaged in furthering the interests of the Roman Catholic faith. It has the benevolent approval of the Pope and the Roman Catholic hierarchy. It has endowed chairs in Catholic Universities; published a special edition of the Catholic Encyclopedia; founded and endowed many scholarships for devout and needy students, and endeavored in every way in the press, on the platform, by bulletins and periodicals to uphold and strengthen the loyalty of Catholics to their church. It has been active in movements looking toward social welfare and civic betterment, and has contributed largely from its funds in cases of great disasters like the San Francisco earthquake, the Kansas floods and the Halifax explosion. Its work was memorable in the World War.

Though secret, the organization is not oath-bound. It opposes socialism, exalts patriotism, frowns upon the liquor business and as an organization holds itself aloof from political activities. In 1923 it had 780,000 members.

KNIGHTS OF LABOR, a labor organization founded by garment-cutters in Philadelphia in 1869, led by Uriah Stevens. It was then a secret society and all trades were admitted. At the close of 1872 there were 27 locals in Philadelphia; the gold-beaters of New York forming the first outside branch. Politicians, physicians, lawyers, and liquor-dealers were barred at first, and the last two mentioned still are. Seven states were represented at the first assembly which declared its purpose to organize, educate, and direct the power of the industrial masses and secure to workers the full enjoyment of the wealth they create. Demands were made for a referendum, bureau of labor statistics, abrogation of class laws; no child labor under 15; the abolishment of convict labor; both sexes to have equal rights, etc. Secrecy was abandoned in 1881. The officers are General Master Workman, General Worthy Foreman, General Secretary-Treasurer and there is a General Executive Board. In 1886 the organization had 300,000 members, but there was a split and the American Federation of Labor (*q. v.*) was founded. Now the Knights number less than 100,000. Strikes were condemned in 1881 but later the organization took part in many. General Master Workman, J. W. Hayes, Washington, D. C.] 1922.

KNIGHTS OF MALTA, see Hospitallers.

KNIGHTS OF PYTHIAS, a fraternal benevolent, and charitable association founded in Washington, D. C., February 19, 1864, by Justus Henry Rathbone and four others. Religious tolerance, obedience to the law, and loyalty to the government were declared to be its leading principles. After Washington Lodge, No. 1, was founded others followed, then interest declined so that at the close of 1865 there remained only Franklin Lodge, No. 2. In the following year the brotherhood gained new strength and in 1868 there were 68 grand lodges represented when the Supreme Lodge was constituted. The Supreme Lodge governs the others. State and provincial lodges have authority over 10, or more lodges, subordinate lodges that create membership and confer ranks "Page," "Esquire," and "Knight." There is also an "endowment" and a "uniform" rank military divisions to which admission is voluntary for knights in good standing. The "Pythias Army" is now a feature of all assemblies. It offered its services to the government in the Spanish-American war. Since its foundation the Knights have disbursed over $50,000,000 in benefits. Supreme Chancellor G. C. Cabell. Supreme Lodge, Minneapolis. Membership 908,454, 1922.

KNIGHTS OF RHODES, see Hospitallers.

KNIGHTS OF THE GOLDEN CIRCLE, society formed in U. S. A. during Civil War to stop the war; membership about 250,000.

KNIGHTS TEMPLAR, a branch of the Masonic order. Different theories have been advanced as to the origin of the Knights Templar, of their first connection with the Masons and the development of the association as it is today. Can they claim descent from the Crusaders of the Middle Ages? Enquirer must be referred to literature on the subject. The earliest reference to the Knights Templar in the United State

as allied to Masonry is in a "Lodge Warrant" of the Royal Arch Lodge, Boston, Mass., August 25, 1769. The first in England was the Phoenix Lodge, October 21, 1778, and in Scotland, the Kilwinning Lodge, October, 1779. The Grand Lodge of York authorized the degree Knight Templar in 1780. A Grand Lodge of Knights Templar in the United States was instituted June 11, 1816. Wherever the British soldiers were encamped in that period lodges sprung up. Grand Master L. P. Newby, Knightstown, Indiana. Membership, 315,426, 1922.

KNITTING, the forming of a looped web or fabric, may be done (1) by hand; (2) on a frame.

(1) *Hand Knitting* has for appliances two or more straight needles of wood or iron, by the aid of which the fabric is made up from one continuous thread.

(2) *Framework Knitting* was introduced about 1589 by William Lee of Nottinghamshire, the mechanical principles of whose invention remain almost unaltered to the present day. By providing in the 'hand-stocking frame' a needle for each loop, so that all loops in one row were formed simultaneously, the speed of knitting was increased from 100 stitches per minute by hand to 600 stitches per minute on the frame. The frame was of coarse gauge—only 16 needles in 3 in.—and necessitated the thread being laid over needles by hand. Improvements have continued to be made on the frame until at the present time some are at work with as many as 45 to 50 needles to the inch. In order to vary the stitch produced on the hand frame, a 'tuck' presser was added in 1745. This had its edge cut instead of plain, and so could press any one needle beard or leave one open, and thus allow old and new loops to remain together on needles for one or more rows. In this way fancy designs were introduced.

Mechanical Frames driven by steam power were introduced in 1828, and from that date the hand warp frames were gradually superseded by the rotary frames and looms, the machines of today. Hand frames are now only in use for exceptional work—*e.g.*, for gloves and fancy shawls.

Circular Knitting—About 1830 a French inventor introduced a machine for circular knotting by means of a series of bearded needles radiating outwards from a revolving ring, the loops being formed by sinkers which also revolved. Many improvements continued to be made on this machine until 1870, when an Amer. automatic machine was introduced into England. Either flat or circular fabrics can be made on this machine, which has improved by successive inventions so as to produce either plain or ribbed material.

KNOBLOCK, EDWARD (1874), dramatist; *b.* New York City. He graduated from Harvard in 1896, whereupon he studied the drama in Paris for a year and then settled in London to write plays. His first production was an adaption from the French. His subsequent plays include *My Lady's Dress*; *Milestones* (in collaboration with Arnold Bennett); and *Tiger, Tiger*. He became a naturalized British subject in 1916, and was in the British service during the World War as a lieutenant, afterwards becoming captain.

KNOT, in its simplest form is a knob on end of a rope or cord to prevent slipping. More elaborate k's are used for fastening rope to rope, or rope to ring or beam. Common k's used by sailors are the Overhand, Reef, Bowline, Half Hitch, Clove Hitch, Timber Hitch, and Blackwall Hitch.

KNOUT, a whip used in Russia for the punishment of criminals, said to have been introduced under Joan III., 1462-1505. There were various kind of Ks. One consisted of many thongs of skin plaited and interwoven with wire, ending in loose wire ends, like the cat-o'-nine tails.

KNOWLES, SIR JAMES (1831-1908), Eng. architect and writer; with Tennyson founded the Metaphysical Soc., 1869; became edit. of *Contemporary Review*, 1870; founded the *Nineteenth Century*, 1877.

KNOWLES, JAMES SHERIDAN (1784-1862), a dramatist; *s.* of James K., the lexicographer, after failing in several callings, turned as a last resource to the writing of plays, in which occupation he achieved considerable success. His tragedy of *Caius Gracchus* was produced at Belfast in 1815, and won much praise. Five years later his *Virginius*, suggested to him by Kean, was performed at Drury Lane. For Macready at Covent Garden he wrote *William Tell, 1825*; and three years later was produced *The Beggar's Daughter of Bethnal Green*. His other plays were *Alfred the Great, 1831*; *The Hunchback, 1832*; and *The Love Chase, 1837*. Though highly esteemed in his day, his work is not now held in much regard, and his plays are rarely performed. There is a biography by his son, Richard Brinsley K., 1872.

KNOX COLLEGE, a co-educational and undenominational institution situated at Galesburg, Ill. It was originally known as the Knox Manual Labor

College, founded in 1837, and received its present name in 1857. It was in the college grounds that the historical Lincoln-Douglas debate was held in 1858, and the fortieth anniversary of that event was celebrated in 1898 with President McKinley and his cabinet present at the exercises. In 1922 there were 550 students and a teaching staff of 43 under the direction of J. L. McConaughy.

KNOX, HENRY (1750-1806), Revolutionary artillery general and statesman; *b.* Boston, Mass.; *d.* Thomaston, Maine. He was conducting a bookstore when the Revolution came, and promptly became aligned with the patriots, taking part in the battle of Bunker Hill. He performed an act of signal service to Washington's army by bringing a number of artillery pieces and ammunition of which it was in real need, from Fort Ticonderoga to Cambridge, risking perilous difficulties in making the journey with a mounted squad. He was appointed commander of the Revolutionary army's only artillery regiment and took part in the battles of Dorchester Heights, Trenton, Princeton, Brandywine, Germantown, Monmouth, and in the operations against Cornwallis in 1781. He became major-general in 1782, was assigned to disband the Revolutionary army the next year, and founded the Society of the Cincinnati. He was Secretary of War from 1785 to 1795 and headed also the Navy Department on its formation in 1794.

KNOX, JOHN (1505?-72), Scot. reformer; *b.* Haddington, Scotland; took orders as secular priest, and practised as a notary in Haddington *c.* 1540. In 1546, he came under influence of Wishart. After Wishart's arrest K. went to St. Andrews, where, in 1547, he preached Protestantism in parish church. When St. Andrews was taken by the French, in 1547, he was taken prisoner, and for nearly two years worked in Fr. galleys. On his release he returned and became minister at Berwick and afterwards at St. Andrews, being also appointed chaplain to Edward VI. During Mary's reign he lived on the Continent. In 1559, he returned to Scotland, joined Lords of Congregation, and drew up *Confession of Faith, 1560.* With Mary, Queen of Scots, he had several heated debates concerning her religion. His sermons after the marriage of Mary and Darnley resulted in his being forbidden to preach; nevertheless, after Mary's abdication he preached the coronation sermon of James VI. at Stirling. In 1569, he retired to St. Andrews, but returned to Edinburgh, in 1572, and preached in St. Giles on the subject of the massacre of St. Bartholomew's eve. His *History of the Reformation in Scotland* is an important work. Other writings include *The Blast of the Trumpet against the Monstrous Regiment of Women.*

KNOX, PHILANDER CHASE (1853-1921); *b.* in Brownsville, Pa., May 6, 1853; *d.* in Washington, October 12, 1921. Graduating from Mount Union College, in 1872, he studied law and was admitted to the bar in 1875. Assistant district attorney for the western district of Pennsylvania, 1876-1877. He resigned to open a law office in Pittsburgh with J. H. Reed, and the firm became famous as counsel for corporations. Mr. Knox was counsel for Carnegie in the Homestead case, in 1892. From April, 1901, to June, 1904, he was attorney-general of the United States; then senator for Pennsylvania to fill out Senator Quay's unexpired term. Re-elected for full term, in 1905. In 1909, he became Secretary of State in Taft's cabinet, a position in which he gave less satisfaction than as attorney-general. In 1912, he made a tour of the Latin countries to strengthen friendly relations with the United States. He was re-elected to the Senate in 1916, for the term 1917-1923. Author of *Future of Commerce, International Unity,* 1910; *Speeches,* 1912.

KNOXVILLE, a city of Pennsylvania, in Allegheny co. Its industries include the manufacture of flour and dairy products. It has also tobacco factories and warehouses. Pop. 1920, 7,201.

KNOXVILLE, a city of Tennessee, in Knox co., of which it is the county seat. It is on the Southern, the Louisville and Nashville, and other railroads, and on the Tennessee River. It is the head of navigation on the river and has a large trade in lumber and other commodities. Its industries include sawmills, iron and nail works, car and railroad shops, cotton and woolen mills. It is the seat of many important educational institutions, including the University of Tennessee, Knoxville College for Colored Students, and an experiment station. There are also several high schools, libraries, the Eastern State Insane Asylum, State Institution for Deaf Mutes, and the Lawson McGee Memorial. Knoxville was founded in 1792 and was chartered as a city in 1815. It was enlarged in 1889. by the incorporation of West Knoxville and North Knoxville. Pop., 1920, 77,818.

KNUCKLEBONES, ancient game, played by Greeks; still survives as children's game, played with joint-bones of sheep; object to throw them up and catch them in various ways; five generally used.

KNUTSFORD (53° 18′ N.; 2° 22′ W.); town, Cheshire, England; described in

Mrs. Gaskell's *Cranford*; manufactures leather, cottons. Pop. 5,800.

KOALA. See under MARSUPIALS.

KOBBÈ, GUSTAVE (1857-1918), music critic; *b.* New York City. As a boy he studied music composition and the piano at Wiesbaden, Germany, where he was sent, and returned to the United States to pursue his studies at Columbia. After engaging in journalism he became, 1905, music critic of the *New York Herald*. Much of his writings published in book form relate to musical subjects, notably to Wagner and his operas.

KOBDO (47° 57′ N., 89° 58′ E.), town, Mongolia; fortified; sheep raised in district. Pop. *c.* 6,000.

KOBÉ, a town of Japan on the island of Hondo on the Bay of Osaka. It joins the city of Hyogo. In 1868, it was opened to foreign trade, and the city of Hyogo was opened at the same time, the former becoming the foreign residential quarter. Since 1892, the two towns have formed one. It possesses an excellent harbor, and has superseded other Japanese ports in trade and in the number of ships visiting the port. It has also an imperial shipbuilding yard. Pop. 378,197.

KOCH, ROBERT (1843-1910), a celebrated German physician, founder of modern bacteriology; educated at Göttingen. He isolated the bacillus of anthrax, 1876, later proposing a means of preventative inoculation against the disease. In 1882, he discovered the bacillus of tuberculosis, and led the cholera expedition to Egypt and India, 1883, finding the cause of cholera in the comma bacillus. Koch was professor at Berlin University, 1885, and director of the Institute for Infectious Diseases, 1891. He prepared tuberculin, 1890-91, a lymph or 'paralotoid' by which he hoped to effect a cure of phthisis, but it has failed to prove a remedy, though valuable as a diagnostic agent. Koch held that there was a distinction between tuberculosis in man and in cattle, and denied the possibility of transmission of the disease from one to the other. The English Royal Commission Reports on Tuberculosis, 1904, 1907, 1909, 1911, strongly support the opposite view. In two visits to South Africa, 1896 and 1903, Koch studied the 'rinderpest' (cattle-plague), investigated malaria and its causes in German East Africa, 1897, and the West African 'sleeping-sickness', 1905-6.

KOCK, CHARLES PAUL DE (1794-1871), a French novelist, more popular abroad than in France itself. His novels deal mostly with Parisian middle-class and low life in a witty and realistic manner. Among the chief are: *Georgette, 1820*; *Gustave*; *Mon Voisin Raymond*; *André le Savoyard, 1825*; *Le Barbier de Paris, 1826*. See *Mémoires, 1873*; Grimm, *Vie, 1873*.

KODAIKANAL, health-resort, Madras province, India.

KODAK, a photographic camera of special type for taking instantaneous negatives. It is extremely easy to use, and is small enough to be carried about in the hand or pocket.

KODIAK. See KADIAK.

KODUNGALUR, CRANGANUR, (10° 13′ N., 76° 12′ E.), town, Madras, India. Traditionally connected with St. Thomas. Pop. 30,000.

KOESFELD (51° 57′ N., 7° 9′ E.), town, Westphalia, Prussia. Pop. 9,500.

KOHAT (1) (33° 25′ N., 71° 20′ E.), district, Peshawar, India; area, *c.* 2,770 sq. miles; salt mines. Pop. 218,000. (2) (33° 33′ N., 71° 23′ E.), town and capital of above. Pop. 31,000.

KOHAT PASS (33° 35′ N., 71° 27′ E.), pass leading from Peshawar to Kohat, India.

KOHISTAN (35° N., 73° 20′ E.), mountainous region, N.W. India; crossed by Indus. Pop. *c.* 15,000. *K.* (35° N., 70° E.), district, Afghanistan.

KOKOMO, a city of Indiana, in Howard co., of which it is the county seat. It is on several important railroads and on the Wildcat river. It is the center of an important farming region and the chief industries are included in agriculture and stock raising. It has several charitable institutions, a public park and a public library. Pop. 1920, 30,067.

KOKO-NOR (36° 50′ N., 100° E.), lake, Tibet.

KOKSTAD (28° 30′ S., 29° 25′ E.), town, Griqualand East, S. Africa. Pop. 3,000.

KOLA, OR COLA, a genus of plants found in western tropical Africa. It produces a fruit, the seeds of which contain caffeine, together with the same active principle as cocoa. The drink produced from them is largely used in Africa and has been introduced into other countries.

KOLA (67° 30′ N., 36° E.), peninsula, district, Russia, between White Sea and Arctic Ocean; Ekaterininsk superseded Kola as capital, 1899.

KOLABA (18° 25′ N., 73° 12′ E.), mountainous district, Bombay, India; rise. Pop. 607,000.

KOLAR.—(1) (13° 5′ N., 78° 5′ E.), district, Mysore, India; area, *c.* 3,000 sq. miles; gold mines. Pop., 1901, *c.* 700,000. (2) (13° 6′ N., 78° 7′ E.), town, Mysore. Pop. 12,500.

KOLBERG (54° 10′ N., 15° 32′ E.), port, Pomerania, Prussia; former fortress; joined Hanseatic League. Pop. 25,000.

KOLCHAK. See KOLTCHAK.

KOLDING (55° 29′ N., 9° 28′ E.), town, Denmark. Pop. 14,000.

KOLGUEV (69° N., 48° 45′ E.), island, off N. coast, Russia, in Arctic Ocean.

KOLHAPUR.—(1) (16° 30′ N., 74° 10′ E.), native state, Bombay; area, 3,165 sq. miles; rice, tobacco; manufactures textiles. Pop., 1911, 833,441. (2) (16° 43′ N., 74° 13′ E.), town, capital of above; ruined Buddhist shrines. Pop., 1921, 48,122.

KOLLIKER, RUDOLPH ALBERT VON (1817-1905), Swiss physiologist, anatomist, and zoologist. His microscopical researches into the minute structures of the tissues of man and of the lower animals, his studies of the embryological development of vertebrates and invertebrates, and his general zoological inquiries gave an early stimulus to a refined type of microscopical analysis.

KOLIN, NEU-KOLIN (50° 4′ N., 15° 14′ E.), town, Bohemia. Here Austrians defeated Prussians, 1757. Pop. 17,000.

KOLOMEA (48° 31′ N., 25° 1′ E.), town, Poland. Pop. 43,000.

KOLOMNA (55° 7′ N., 38° 46′ E.), cathedral town, Moscow, Russia. Pop 21,500.

KOLOZSVAR, KLAUSENBURG (46° 44′ N., 23° 33′ E.), town, Hungary; has univ., Gothic church, citadel; Episcopal see of Unitarian and Reformed Churches; birthplace of Matthias Corvinus. Pop. 60,000.

KOLTCHAK (or **KOLCHAK**), **A. V.** (1874-1920), Russian admiral and soldier. Entered the navy, 1891, and was promoted to officer's rank, 1894; in 1903 he crossed the Arctic from the Lena to Bennet I. for the relief of Baron Tol, who had wintered there, but found no trace of explorer. During Russo-Jap. War he distinguished himself in the defence of Port Arthur and received several decorations. From 1906 to 1912, he was on the naval general staff, and took a very active part in reorganizing that branch of the service. During the World War his distinguished military gifts and personal gallantry won for him a series of rewards and also promotion to rear-admiral, 1916. Subsequently he was given an independent command in the Baltic, and still later promoted vice-admiral and commander of the Black Sea fleet. After the revolution, 1917, he was the leader of the Whites, or Anti-Bolshevists, and his brilliant successes at first rapidly obtained for him the virtual leadership of Russia. But from 1919, he gradually lost ground, and by the end of that year, after a brief success around Tobolsk and Ekaterinburg, had to retire across the Irtish, where he lost his guns and supplies. In Jan., 1920, an anti-Koltchak revolution broke out at Vladivostok, and on Jan. 24, Koltchak surrendered to the revolutionaries at Irkutsk. A few loyalists and Czechs under General Kappel forced their way to the town, but when they reached it found that Koltchak had been shot.

KOLYVAN (55° 10′ N., 82° 40′ E.), town, Tomsk, Siberia. Pop. 12,000.

KOMAROM (47° 46′ N., 18° 7′ E.), town, Hungary; strongly fortified. Pop. 17,000.

KOMATI (25° 45′ S., 32° 42′ E.), river, S.E. Africa; source in S.E. Transvaal; enters Delagoa Bay.

KOMOTAU (50° 27′ N., 13° 26′ E.), town, Bohemia; textiles, fruit, beer. Pop. 20,000.

KOMURA, MARQUESS JUTARO (1854-1911), Jap. statesman; sent by government to acquire modern education at Harvard Univ.; on return, served first in ministry of justice, then foreign affairs; attaché to Jap. legation at Peking; governor of Manchuria during Jap. occupation; minister successively at Seoul, Washington, Petrograd, and Peking; minister of foreign affairs, Tokio, 1900; conducted the negotiations before Russo-Jap. War; senior plenipotentiary at peace conference at Portsmouth, U.S.; one of the chief authors of Anglo-Jap. agreement.

KONG (8° 58′ N., 3° 23′ W.), town, Fr. Ivory Coast, W. Africa. Pop. *c.* 14,000. K. district has pop. *c.* 400,000. K. hills reach height of over 4,500 ft.

KONGSBERG (59° 36′ N., 9° 43′ E.), town, Norway; silver mines. Pop. 6,000.

KONIA (*c.* 37° 53′ N., 32° 19′ E.), vilayet, Asiatic Turkey; area, 39,410 sq. miles. Pop. *c.* 1,069,000. K., capital, was for several cent's Seljuk seat of government; manufactures carpets, woolens. Pop. *c.* 45,000. See ICONIUM.

KONIECPOLSKI, STANISLAUS (1591-1646), Polish general; defeated Swedes at Homerstein, 1627; Trzciand, 1629; also defeated Tatars, Turks, and Cossacks.

KÖNIG, KARL RUDOLPH (1832-1901), Ger. Physicist and manufacturer of tuning-forks; made important investigations in acoustics.

KÖNIGGRÄTZ (50° 13′ N.; 15° 49′ E.), town, Bohemia; XIV. cent. cathedral. Pop. 11,000.

KÖNIGINHOF (50° 27′ N.; 15° 46′ E.), town, Bohemia, founded by Wenceslaus II., XIII. cent. Pop. 15,000.

KÖNIGSBERG (54° 43′ N., 20° 31′ E.), town, Prussia, Germany; commercial and industrial center of E. Germany, and a great tea center of Europe; important military and naval fortress; has royal palace, univ., XIV. cent. cathedral; various educational and charitable institutions; birthplace of Kant. Machinery, linen, wood pulp, chemicals, sugar, tobacco, beer, manufactured. Exports cereals, timber, flax, hemp, flour. In the World War, one of the first efforts of the Russians was directed against Königsberg. An army under Rennenkampf established itself opposite the E. defences, and was bringing up its siege train when the disastrous defeat of Samsonov at Tannenberg, Aug. 31, 1914, compelled a retreat. Pop., 1920, 260,900.

KÖNIGSHÜTTE (50° 19′ N., 18° 56′ E.), town, Silesia, Prussia. Pop., 1919, 74,811.

KÖNIGSSEE (47° 34′ N.; 13° E.), lake, Bavaria, Germany.

KONITZ (53° 43′ N.; 17° 34′ E.), town, W. Prussia, Germany. Pop. 12,010.

KONTAGORA, province, Brit. N. Nigeria, Africa; under Brit. control since 1901.

KOO, VI-KYUIN WELLINGTON (1888), a Chinese statesman; *b.* in Shanghai. He was educated in various schools in the United States and graduated from Columbia University, in 1909. He held several important official positions in China, and, in 1915, was appointed minister to Mexico. In the same year he was appointed minister to the United States, serving until 1922. He served on many commissions connected with Chinese affairs, and took a prominent part in the Conference on the Limitation of Armaments. In 1923, he was appointed minister of foreign affairs for the Chinese Republic. He wrote several books on diplomacy and other subjects.

KÖPENICK (52° 35′ N., 13° 32′ E.), town, Brandenburg, Prussia; manufactures carpets, sealing-wax. Pop. 35,000.

KORPÜLÜ, KUPRILI (41° 43′ N.; 21° 56′ E.), town, Turkey-in-Europe. Pop. *c.* 20,000.

KORAN, AL KORAN, QUR'ÁN, AL QUR'ÁN, the 'Bible' of Muhammadans, and the work of Muhammad himself. A divine inspiration is claimed for it by believers more rigid and absolute than the Christian Church has ever claimed for the Bible. The K. for Muhammadans is uncreated, having existed eternally in in the mind of God until it was revealed to Muhammad; the K. therefore, exists in Heaven, and that on earth is only a 'copy.' It is composed of chapters, called *Suras*, though the exact meaning of the word is uncertain. It covers a great variety of subjects, and confusion is produced by the suras having sometimes got out of their original order; but even when this is preserved, change is often abrupt. Muhammad, too, was a mystic rather than a systematic thinker, so the 'chaotic' character (as it has been called) of the book is not surprising. The K. is fiercely monotheistic, and the worship of Christ as Son of God is therefore denounced.

The K. attacks Jews more than Christians, with whom Muhammad seems to have come but little into contact. At the beginning of 29 of the suras certain letters stand, the meaning of which both native and European scholars have endeavored to discover, but without success. The first sura has been called the 'Lord's Prayer' of Muslims. That portion of the K. which is concerned with women is the least edifying of the whole. It has been disputed whether Muhammad himself could write—probably he could a little; but his thoughts and revelations were certainly written during his lifetime, whether by his own hand or another. At his death the K. was both scattered and fragmentary. These were collected, and there was much dispute over the correct version. Finally, all copies except one were ordered by the Caliph Othman to be burnt, and the one was copied by Zaid. From this all existing MSS. (some of which go back to the I. cent. after the Flight) are derived, though sometimes other readings are found. But it is fairly certain our K.contains no interpolations. Several mediæval and modern commentaries exist.

KORDOFAN (12° 30′ N., 31° 30′ E.), province, Anglo-Egyptian Sudan, W. of White Nile; area, variously estimated at from 41,000 to 130,000 sq. miles; rolling plains, 1,300 to 1,900 ft., with isolated peaks rising to 2,600; no rivers; millet, gums; cattle and camels reared; exports

gum, hides, ivory, gold. K. belonged in turn to rulers of Senaar, Darfur, Egypt; passed under control of reorganized Sudan Government, 1899. Pop. over five millions, including persons of Arab, Turkish, Egyptian, and negro descent.

KOREA, or CHO-SEN (38° 20′ N., 127° 40′ E.), peninsular country, E. coast of Asia; lies between Yellow Sea and Sea of Japan. Surface is mountainous, traversed from N. to S. by range which rises to height of over 8,000 ft.; drained by Han, Tai-dong in W., Yalu, Tumen in N., and other streams. Chief towns, Seoul (cap.), Ping-Yang, Songdo. Climate of great extremes; there is a summer rainfall. See Map of Asia.

Principal industry is agriculture; about 5,600,000 acres are under cultivation, but agricultural methods are extremely primitive. Korea produces rice, wheat, and other grains, tobacco, cotton, cattle. There is some whale-fishing, and many small fishing colonies are around shores. Minerals include gold, which is extensively worked, coal, copper, iron, graphits, mica. Exports are cereals, gold, ginseng, hides, cattle. Railway mileage, 1,092.

Religions are ancestor worship and Confucianism; Buddhism is not now important, and there are many converts to Chirstianity. The inhabitants, besides Koreans themselves, include Chinese, Japanese, Americans, British, French, Germans. Area, *c.* 84,000 sq. miles. Pop. 16,998,200.

In early times Korea included three independent kingdoms which, owing to Chin. influence, attained considerable degree of civilization. After various vicissitudes, Korea became an independent kingdom in X. cent.; overrun by Mongols under Jenghiz and Kublai Khan in XIII. cent.; came under suzerainty of Ming emperors of China in XIV. cent.; invaded and ravaged by Japanese in 1592-8, since when it has been subject of continual dispute between China and Japan. In 1894, Chinese-Jap. War broke out, which resulted in defeat of Chinese, and proclamation of Korean independence. In 1904, occured Russo-Jap. War, at end of which Japan obtained formal recognition of her right to control Korean affairs. In 1907, Emperor of Korea abdicated, and in 1910, the country was annexed to Jap. empire. Administered by gov.-gen., who represents Japan.

KOREA (23° 30′ N., 82° 30′ E.), feudatory state, India. Pop. 37,000.

KOREN, JOHN (1861), an American statistician; *b.* at Decorah, Ia.; *s.* of Vilhelm and Elizabeth Koren. He was educated at Luther College, Decorah, Ia., and at Concrodia Sem., St. Louis, and also studied abroad. He resided in Boston from 1884, where he was engaged in religious work for several years. In 1891, he was a special expert abroad for the U.S. Dept. of Labor; the following year was sent to Europe to study the Gothenburg system, and from 1894-9 was in the service of a commission of 50 to investigate the liquor problem. He was also at one time expert special agent U.S. Bureau of Census, and international prison commissioner for the U.S. Author of *Alcohol and Society*, and others.

KORIN, OGATA (*c.* 1655-1716), Jap. artist; painter of very individual gifts; examples much sought after by collectors; gave his name to the Korin school.

KORNER, KARL THEODOR (1791-1813), Ger. poet; *b.* Dresden; wrote patriotic poetry (*Leyer und Schwert*) and plays.

KORNILOV, LAVR GEORGIEVICH (1870-1918), Russian general, of Cossack birth; entered army, 1888, and prior to the World War passed greater part of his career in Asia. During Russo-Jap. War he fought at Mukden, Sanden, and Teliff, and in retreat from Mukden gained distinction. From 1907 to 1911, he was Russian military agent in China, and later received various commands in Siberia. On the outbreak of the World War, 1914, he was given command of a division of Brussilov's army, and covered himself with glory in the early days of the campaign. During Russian retreat, April, 1915, in order to secure the safe and uninterrupted evacuation of the army, he maintained an obstinate fight with a small rearguard. The army escaped, but the rearguard, including Kornilov, who was seriously wounded, were captured. Some fifteen months later he effected his escape disguised as an Austrian soldier, and after various hairbreadth escapes reached Rumania on the eve of her declaration of was against Austria. Within a month he was given command of the 25th Army Corps and was back in the fighting line. On the outbreak of the revolution in Russia, March, 1917, he became commander-in-chief of the troops in Petrograd; but indiscipline being rampant in the army and fostered by the Council of Workmen and Soldiers Delegates, he resigned the command for that of the 8th Army. On Aug. 1., he succeeded Brussilov as generalissimo, and at once took strong military measures for the restoration of discipline. In Sept., 1917, he demanded that Kerensky should devolve on him all civil and military power; whereupon he was dismissed, and marched with his troops on Petrograd. His movement

collapsed, and on Sept. 15, he surrendered to General Alexeieff. He managed to escape to the Caucasus, where he gathered together a force of volunteer Cossacks, but was killed in front of Ekaterinodar, March, 1918

KOROCHA (50° 49′ N., 37° 14′ E.), town, Russia. Pop. 15,000.

KOROLENKO, VLADIMIR (1853), a Russian novelist. He began to write at the age of 30 when in exile as a political criminal in Siberia. His works became widely read and greatly admired. They include *Bad Company*, *The Dream of Makara*, etc.

KORSÖR (55° 19′ N.; 11° 8′ E.), port, Denmark. Pop. 10,000.

KORTCHA (40° 43′ N., 20° 51′ E.), cathedral town, Albania. Pop. *c.* 10,000.

KOSCIUSCO (36° 22′ S., 148° 20′ E.), mountain peak, Australia, *c*, 7,325 ft.

KOSCIUSZKO, TADEUSZ ANDRZEJ BONAWENTURA (1746-1817), Polish statesman and general; *b.* at Mercezewszczyzna, Lithuania; served in Amer. army, 1776-86, becoming adjutant to Washington, in 1777; returning to Poland, he became a leader in the reform of 1790, and served with distinction against Russia, in 1792. He afterwards withdrew to Leipzig, whence he returned in 1794, to take command in the Polish rising of that year; gained some slight successes at first, and defeated Russians at Raclawice; but he was subsequently routed at Rawka, and after other reverses was finally defeated and captured at Maciejowice, Oct. 4, 1794. He was released from prison by Paul I., in 1796, and after 21 years spent in America, France, and Switzerland, he died at Salothurn, 1817.

KOSHER, or KASHER, a Hebrew word meaning 'fit,' and is therefore opposed to *pasul* (unfit). It is especially applied by Jews to meat which has been slaughtered according to Mosaic law.

KÖSLIN (54° 13′ N., 16° 10′ E.), town, Pomerania, Prussia. Pop. 25,000.

KOSLOV, a town in the province of Tambov, Russia, about 250 miles S.E. of Moscow. The district in which it is situated is noted for its horses, and before the World War, Koslov had a large trade in live stock. Two railroad lines make their junction there. Pop., about 50,000.

KOSSOVO (43° N., 21° 30′ E.), former Turk. vilayet, now divided between Jugo-Slavia and Albania; elevated plain; chrome mines; fruits, tobacco, cereals, opium. Plain, known as 'Field of the Blackbirds,' was scene of disastrous defeat of Serbians by Turks, 1389, still commemorated. During World War, retreat from the Kossovo plateau, Nov. 23-25, 1915, practically meant the evacuation of Serbia. Area, 12,700 sq. miles. Pop. 1,040,000.

KOSSOVO (42° N., 22° E.), vilayet, Turkey-in-Europe; area, 12,700 sq. miles. Fruits, tobacco, cereals. Pop. *c.* 200,000.

KOSSUTH, LAJOS (1802-94), a noted Hungarian patriot; *b.* at Monok, Hungary; imprisoned in 1838, for circulating reports of debates in National Diet; after his release he edited the *Pesti Hirlap*, a party periodical, for several years, and, in 1847, he entered Diet and became leader of National League, which aimed at Hungarian independence. In 1848, the Diet declared independence of Hungary, and app. K. governor; after suppression of the revolt by Emperor of Austria, he had to take refuge in Turkey; he subsequently lived in England and Italy, his hostility to Austria preventing him from taking advantage of general amnesty. Author of *Memories of my Exile*.

KOSTROMA (57° 10′ N., 42° E.), government, Central Russia; area, 32,432 sq. miles; surface, undulating plateau; timber. Pop., 1910, 1,700,900. *Kostroma*, capital, an old cathedral town, manufactures linen. Pop. 50,000.

KOTAH.—(1) (25° N., 76° E.), native state, Rajputana, India; area, 5,684 sq. miles; cereals, tobacco. Pop. 640,000. (2) (25° 8′ N., 75° 47′ E.), town. Pop. 35,000.

KOTZEBUE, AUGUST FRIEDRICH FERDINAND VON (1761-1819), Ger. dramatist; *b.* Weimar; held high official post in St. Petersburg, 1871; app. director of Viennese Burgtheater, 1797; assassinated, 1819; wrote numerous plays; *Menschenhass und Reue* (drama) for long the most popular play in Germany and England.

KOUMISS, beverage prepared by the Tartars since ancient times, by fermenting mare's milk; but may be made by dissolving one-half oz. of grape sugar in 4 fl. oz. of water and 20 gr. of yeast in 4 fl. oz. of cow's milk, pouring both into a quart bottle, which is then filled up with milk, corked, kept cool, and shaken frequently for four days; it is a valuable stimulant food in conditions of exhaustion and in convalescence after severe illness, being easily digested and containing a little alcohol.

KOUSSO, CUSSO, drug consisting of the dried panicles of pistillate flowers of a tree, *Brayera anthelmintica*, of natural

order *Rosaceæ*, growing in Abyssinia; obtained commercially in form of rolls, 1 ft. to 2 ft. long; has a bitter taste and tea-like odor, its active principle being the neutral *Koussin* ($C_{31}H_{38}O_{10}$); employed medicinally as anthelmintic for all kinds of tapeworms.

KOVALEVSKY, SOPHIE, SONJA (1850-91), Russ. mathematician; did brilliant work on partial differential equations.

KOVNO (54° 56′ N., 23° 53′ E.), cap. of Kovno prov., Lithuania; at bend of river Niemen at its confluence with the Vilia. Described by Ludendorff as 'typical Russian town, with low, mean wooden houses and comparatively wide streets'; encircled by hills. Before World War had soap, candle, match, tobacco, and nail factories, tanneries, iron foundries, etc., and was important commercial center; annual fair, June 29-July 12. Pop. (one-third Jews). 80,000. At outbreak of World War was a first-class fortress, one of the three forming the Polish triangle; attacked by Hindenburg, Aug. 8-21, 1915; subjected to terrible bombardment from heaviest guns, including 16.5 in.; Ger. infantry sent forward before reduction of fortress suffered very heavily—according to Austrian report 100,000 Ger. lives lost before defences fell, Aug. 17. Russians withdrew in good order, leaving only rearguard, 20,000, to hold the place.

KOYETSU, HONNAMI (*d.* 1637), Jap. artist and artificer; brilliant exponent of the Korin school, whose pictures chiefly were illustrations of his own poems.

KRAGUYEVATS, KRAGUJEVATZ, or KRAGUJEVAC (44° 1′ N., 20° 53′ E.), town, Serbia, Jugo-Slavia, 60 miles S. S.. of Belgrade; government arsenal; was one of obejctives of abortive Austrian offensive, Dec., 1914; was captured during German-Austrian-Bulgarian invasion of 1915, and remained in enemy hands until armistice with Bulgaria, Sept. 30, 1918. Pop. 15,000.

KRAKATOA (6° 9′ S., 105° 26′ E.), volcanic island, Strait of Sunda, between Sumatra and Java, where one of most terrible volcanic eruptions ever known occurred, in 1883. Disturbances continued from May to Sept., culminating in explosions of Aug. 26-28, when greater part of island was blown up; followed by enormous ocean waves which destroyed several hundred villages and caused grate loss of life. See *The Eruption of Krakatoa*, by G. J. Symons.

KRALYEVO (23° 40′ N., 20° 43′ E.), town, Serbia. In vicinity is celebrated monastery of Studenitsa. Pop. 4,000.

KRASNOYARSK (56° 6′ N., 93° E.), town, E. Siberia. Pop. 65,000.

KRASSIN, LEONID BORISOVICH (1870), Russian Soviet minister; *b.* Siberia, of *bourgeois* family; studied engineering, but owing to revolutionary tendencies expelled Technological Institute, Petrograd. Thereafter engaged in plots against Tsar's government while continuing his work as electrical engineer. Arrested at Viborg, 1907; he escaped to Berlin, where he obtained employment; was pardoned, and returned to Petrograd, 1909, becoming director of branch of firm with which he had been associated in Berlin, and held position until 1918. Following Bolshevist *coup*, Oct., 1917, was offered seat in ministry, but declined. Accompanied Lenin and Trotsky to Brest-Litovsk to negotiate treaty with Germany, March 3, 1918. Commisary of food in Red Army, and later minister of commerce and industry. Went to London, May, 1920, as president of Soviet commercial mission. He took part in the Conferences at Genoa and Brussels, in 1922.

KRAWANG (6° 25′ S., 107° 30′ E.), residency, Java; thermal mineral springs; rice, coffee; linen manufactured.

KREFIELD. See CREFIELD.

KREHBIEL, HENRY EDWARD (1854-1923), music critic; *b.* Ann Arbor, Michigan; *d.* New York City. After acting as musical critic on the *Cincinnati Gazette*, from 1874 to 1880, he joined the *New York Tribune* in the same capacity, and remained with that journal till his death. He published a number of works on music and was an associate editor of *Grove's Dictionary of Music and Musicians*.

KREISLER, FRITZ (1875), an Austrian violinist; *b.* in Vienna, Austria. At the age of ten he won the first prize and gold medal at the Vienna Conservatory, and the *Premier Prix de Rome* at the Paris Conservatory at the age of 12. In 1888-9 he toured the United States with Moritz Rosenthal, the pianist, then returned to Vienna to complete his studies in the gymnasium. In the following year he made his first appearance alone in Berlin, revisiting the United States later in the year, and achieving a remarkable success. He made his first appearance in London, in 1901, and since then has toured Europe and this country very extensively. During the World War he served in the Austrian Army as a captain, being severely wounded, in 1915. He is the author of *Four Weeks in the Trenches—the War Story of a Violinist, 1915*. Since then he has made his home in New York City.

KREMENCHUG (49° 4′ N., 33° 37′ E.), cathedral town, Poltava, Russia; manufactures tobacco, leather. Pop. 75,000.

KREMENETS (50° 7′ N., 25° 36′ E.), town, Russia. Pop. 18,000.

KREMLIN. See Moscow.

KREUTZER, RUDOLPH (1766-1831), Fr. violinist and composer; Beethoven composed for him famous K. Sonata.

KREUZNACH (49° 50′ N., 7° 50′ E.), town, Rhenish Prussia; mineral springs; Roman remains. Pop. 25,000.

KRIEMHILD, heroine of the Nibelungenlied and wife of Siegfried, who married Attila on the murder of Siegfried in order to prosecute her scheme of revenge.

KRILENKO, GENERAL (1885), Russian revolutionary; as a student at the Lublin Lycée he came into conflict with the authorities on account of his revolutionary views; took a prominent part in the elections to the first and second Dumas; tried on charge of sedition, but acquitted, 1906; again arrested, 1913, but escaped and went abroad; returning in 1915, was arrested, and later sent to the front as an under officer; on outbreak of revolution became president of the committee of the 11th Army, and afterwards delegate to the first council of Soviets; arrested by Kerensky, in 1916, but, after Bolshevist government came into power, appointed commander-in-chief of the forces, 1917; resigned this post, in March, 1918.

KRIMMITZCHAU, a city of Saxony, on the Pleisse river. Its industries include the spinning and weaving of wool. Pop. about 25,000.

KRIS, the name of a dagger which forms the chief weapon of the inhabitants of the Malay peninsula. It is made in many shapes and lengths.

KRISHNA, a Hindu deity, the eighth incarnation of Vishnu. His worship has been much in vogue in modern times. He was the son of Vasudeva and Devaki, and his birthplace is given as Mathura, between Delhi and Agra. He is represented as being brave and fearless, but crafty, while in the popular legends concerning him and in his worship as Vallabhachar-va, one sees the most depraved side of modern Hinduism. He figures in the *Harivansa-pairan* and the *Bhagavata-purânas,* two additions of the great Indian epic, the *Mahabharata.* Early ideas of K. are mingled with myths of lightning and fire, heaven and the sun.

KRISHNAGAR (23° 22′ N., 88° 34′ E.), town, Bengal, India. Pop. 25,000.

KRIS KRINGLE. See Nicholas, St.

KRISTIANSTAD, CHRISTIANSTAD (56° 1′ N., 14° 9′ E.), port, Sweden; industrial center. Pop., 1921, 12,740.

KRONSTADT, or **BRASSO** (45° 38′ N., 25° 36′ E.), town, Transylvania, Rumania; chief manufacturing and commercial town of Transylvania; cloth, leather, cement, candles. During the World War, occupied by Rumanian troops, Aug. 29, 1916; retaken by Austro-German forces, Oct., 1916. Pop. 41,000.

KRONSTADT (60° N., 29° 46′ E.), seaport, fortress, and great naval arsenal, Russia; ice-bound from December till end of May; headquarters of Russian Admiralty. After Russian revolution local government was taken over, June, 1917, by Committee of Workmen and Soldiers Delegates, who for a time defied the provisional government. Pop. 68,200.

KROPOTKIN, PETER ALEXEIEVICH, PRINCE (1842-1921), Russian author and revolutionary; *b.* at Moscow. In 1864, he undertook a geographical survey expedition through Manchuria; visited Switzerland, 1872, and joined the International Working Men's Association, but subsequently became an anarchist and devoted his time to spreading reform propaganda; was frequently arrested. Made his home in England from 1886, but returned to Russia after the revolution, 1917. Among his numerous publications are *Fields, Factories and Workshops, 1899,* 5th ed. 1904; *Memoirs of a Revolutionist,* 2nd ed. *1907*; *The Great Revolution, 1908*; and *Terror in Russia, 1909.*

KROTOSCHIN (51° 43′ N., 17° 27′ E.), town, Posen, Prussia. Pop. 15,000.

KRUDENER, BARBARA JULIANA, BARONESS VON (1764-1824), Russian religious mystic; *b.* Riga (Livonia); married Baron K., 16 years her senior; visited France and published *Valerie* (novel), 1803; then Switzerland and Germany, and came in contact with Adam Müller, a peasant prophet, Jung-Stilling, Jean Frédéric Fontaines, and other religious fanatics; gave herself up to preaching, and prophesying; settled at Schlüchten (Baden), 1815; had interviews with Alexander of Russia, greatly influenced him, and was the supposed author of the Holy Alliance; *d.* Karasu Bazar (Crimea).

KRUGER, STEPHANUS JOHANNES PAULUS (1825-1904), Pres. of Transvaal; *b.* in Cape Colony; took part in Great Trek, 1836; rapidly rose to power in Transvaal; led Boers in 1881,

when they asserted their independence, and became pres. in 1883; re-elected, 1888, 1893, 1898; his rooted hostility to the British and Uitlanders generaly precipitated the S. African War of 1899-1902; fled to Europe, 1900, first settling in Holland, and lastly at Mentone. Imbued with strong puritanical spirit, he was an ardent Dutch-Afrikander patriot, and a 'slim' diplomatist; pub. *Memories, 1902.*

KRUGERSDORP (26° 9′ S.; 27° 46′ E.), town, Transvaal, S. Africa. White pop. 15,000.

KRUPP, Ger. firm of steel manufacturers; from quite small beginnings rose to be largest in world; founded, 1810, in Essen by Friedrich Krupp, 1787-1826, who was succeeded by his *s.*, Alfred, 1812-87, under whom the foundry developed amazingly; Bessemer process and steam-hammer adopted; steel guns manufactured. Alfred's *s.*, Friedrich Alfred, 1854-1902, carried on the work, and his *daughter*, Frau Krupp von Bohlen-Halbach, turned the business into a company, 1903. At centenary celebrations, 1912, Krupps owned some 500 mines, quarries, sand-pits, and clay-pits; had factories at Essen, Annen, Rheinhausen, Buckau; possessed Germania shipbuilding yard at Kiel-Tagel (imperial government advancing $12,500,000); supplied guns, armor-plate, etc., to every part of world; employed staff of 70,000. During the World War, 115,000 hands were employed; but with the conversion of the works to peace purposes again, the number has fallen to some 45,000, and these are employed in the manufacture chiefly of engines, cars, and tools. The Krupp works were seized by the French force which occupied Essen and the Ruhr, in January and February, 1923.

KRUTTSCHNITT, JULIUS (1854), an American railway official; *b.* at New Orleans; *s.* of John and Penina (Benjamin) Kruttschnitt. He was educated at Washington and Lee University. He was connected with Morgan's La. & Tex. R.R., from 1878-85, after which he became connected with the Southern Pacific Co., of which he was vice-president from 1904-11, and later chairman of the executive committee and director of same, including the affiliated co.'s operating in Arizona, Louisiana, and Texas. He was also a member of the executive committee and director of the Western Union Telegraph Co. and the Erie R.R., director of Chicago & Erie R.R., also the Harriman National Bank.

KRYPTON (Kr, 82.9), gaseous element in the atmosphere, discovered spectroscopically by Sir William Ramsay; colorless; liquefies at – 152° C.; density 41; marked by brilliant green and yellow line in spectrum; chemically inactive.

KUBAN. (*c.* 45° N.; 40° E.) (1) Russian prov., Caucasus; includes valley of Kuban R. and N. slope of Caucasus range as far E. as Elbruz and plains of Lower Kuban with coast of Sea of Azov; Cossacks and Ger. colonists engage in agriculture; mountaineers (Karachai, etc.), and nomads of plain, rear horses and cattle; petroleum, coal, salt; cap. Ekaterinodar. Area of prov., 36,645 sq. m.; pop. 2,626,000. (2) Riv., Ciscaucasia (anc. *Hypanis* and *Vardan*), 450 m. long; rises on Elbruz; basin, 21,000 sq. m.; enters Black Sea S. of Taman peninsula, and sends one arm N. to Sea of Azov.

KUBELIK, JAN (1880), Bohemian violinist; *b.* near Prague. He was the *s.* of a market gardener, who taught him rudimentary music, and when 12 years of age he continued his studies at the Prague Conservatory, where he acquired a finished technique. He made his debut as a violinist, in 1898, and appeared in Berlin and London two years later. In 1901, he visited the United States, where his playing, especially of Paganini's compositions, met with popular acclamation. Many decorations and other honors were bestowed upon him.

KUBLAI KHAN (1261-94), *grandson* of Jenghiz Khan, and emperor of the Mongols; succ. his *bro.*, Mangu, as khan, 1259; invaded China in 1267, and established there the Mongol dynasty; extended his conquests over Cochin China, Tibet, and beyond the Ural Mts. Westward, thus creating one of the largest empires ever known; his Jap. expeditions were, however, unsuccessful. Marco Polo (*q.v.*) describes the splendor of his court and wisdom of his rule. He established Buddhism in his dominions.

KUCH BEHAR, COOCH BEHAR,— (1) (26° 18′ N., 89° 25′ E.), native state, Bengal, India; area, 1,307 sq. miles; produces rice, tobacco, jute; many rivers. Pop. 600.000. (2) (26° 18′ N., 89° 20′ E.), town. Pop. 10,700.

KUCHAN (37° 8′ N., 58° 26′ E.), town, Persia; destroyed by earthquake, 1895. Pop. *c.* 1,000. *K.* district, pop. *c.* 100,000.

KUEN-LUN (*c.* 36° N., 76° 15′ to 112° 30′ E.), great mountain ranges of Central Asia, extending from the Pamir by N. of Kashmir, and in a curve round N. of Tibet into China proper; length, *c.* 2,400 miles; breadth, 100 to 150 miles, or, if the E. parallel ranges in Tibet and China

be included, about 620 miles; reaches extreme height of c. 24,000 ft., and is crossed by passes from 15,000 to 19,500 ft. above sea level. K. is one of oldest mountain systems of world, consisting of archaic rocks; may be divided into Western, Central, and Eastern K. Western K. consists of many parallel ranges, including Muz-Tagh and Raskem; it extends eastward by Ulugh-Tagh chain, which unites with Arka-Tagh and Altyn-Tagh, the highest parts of Central K. In these regions are many lakes and high plateaux. Central K. includes also Nan-shan range to N.E., and a number of parallel chains lying farther S.; here the Hwang-ho, Yang-tse-Kiang, Mekong, and other rivers of S.E. Asia have their source. Eastern K. narrows to the single chain of the Tsing-ling-shan in China.

KÜHLMANN, RICHARD, BARON VON (1873), Ger. diplomatist and statesman; entered diplomatic service, 1899, and, after serving in various capitals, became counsellor of the Ger. Embassy in London, 1908. On the outbreak of the World War, after missions to Scandinavia and Constantinople, he was sent as Ger. ambassador to the Hague, April, 1915, to Sept., 1916, and to Constantinople, Sept., 1916, to July, 1917; was then appointed foreign secretary in succession to Herr Zimmermann, retaining that position till his resignation, July, 1918, and, as such, was largely responsible for the treaties of Brest-Litovsk and Bukharest; revealed himself as an unscrupulous intriguer.

KUHN, JOSEPH E. (1864); major-general; *b.* Kansas. He graduated from the U.S. Military Academy, in 1885, and entered the army as a second lieutenant, rising in rank by the established grades to major general, in 1917. He was U. S. military attaché and observer during the Russo-Japanese War of 1904-5, and also during the World War, in 1914-16, before the United States became a participant. In that conflict he commanded the 79th Division till its disbandment, in 1919.

KUKA (12° 58′ N., 13° 23′ E.), town, Bornu, Nigeria; formerly great trading center; ruined by Rabeh, 1898; has revived since 1902.

KU KLUX KLAN, secret oath bound organization which sprang up in the Southern states following the Civil War, and for 10 years exerted a powerful influence in the South. Starting in Tennessee, largely as a matter of prankish amusement, it rapidly developed into an instrument for repressing the negro, then newly endowed with citizenship. Many of the latter were ignorant and lawless; and the Klan with its grotesque hoods and ghostly white robes played upon their superstitious fears to keep them in order and insure their good behavior. This at least, was the avowed object, but like all irresponsible organizations, the Klan soon degenerated into an instrument of outrage and terrorism. At the culminating point of its power, it had probably about half a million members. This 'Invisible Empire,' as it was called, was really more potent and feared than the regular established governments of the Southern states. How fantastic was its nature is indicated by the names of its officials who included dragons, hydras, titans, furies, cyclops, night hawks and goblins. It's name arose from the suggestion at its first meeting that it should be called 'Ku-Kloi' from the Greek *Kuklos*, a band or circle. Somebody shouted 'Call it the Ku Klux,' and that title was. finally adopted. Its first official convention was held in Nashville, Tenn., in 1867, when delegates were present from the Carolinas, Alabama, Georgia, Louisiana, and other Southern states. The platform adopted at the national convention was unexceptionable in its avowed objects which were to protect the weak, the innocent and the defenseless; to defend the Constitution of the United States; to aid and assist in the execution of all constitutional laws. In practice, however, the Klan became an instrument of abuse, although undoubtedly at times some of its acts were explainable if not entirely justified by the lawless character of those at whom its power was aimed. The 'Force Bill,' passed by Congress in 1871, sought to suppress the organization, and in October of the same year President Grant issued a proclamation calling on the members of all illegal associations in certain counties of South Carolina to disperse and yield up their arms and disguises to the legal authorities. Hundreds of arrests were made in pursuance of the aims of the proclamation, and the Klan gradually melted away, having accomplished, however, one of the chief purposes of the organization, the maintenance of white supremacy in the South.

In 1915, an order under the same name was established in Georgia, rapidly spreading through the South and extended its membership through the N. and W. to an extent that created national uneasiness and alarm. In this case, the activities of the Klan were directed, not only against negroes, but also against Jews and Catholics. In 1921, revolting murders took place in Louisiana that were attributed to the Klan, and the Governor of that state sought the cooperation of the national authorities to

stamp out the organization. Up to 1923, no official action had been taken by the National Government. Bills, however, were pending in several state legislatures, looking toward the Klan's suppression. The membership of this menacing secret organization, in 1923, was stated to be about 350,000.

KULJA, ILI (43° 38′ N., 81° 38′ E.), walled town and district, N.W. China; has citadel, mosques. Pop. *c.* 12,000. New K., to W., was ruined in 1868. K. district has area, *c.* 21,000 sq. miles; fertile, produces rice, fruits, cotton, tobacco, while horses, sheep, and cattle are bred; held by Russia, 1871-81. Pop. *c.* 136,000.

KULM, a tn. on the R. Vistula, W. Prussia. It has ancient wells and large oil mills, saw mills, and machinery works. Its trade is important. Pop. 11,720.

KULMBACH (50° 6′ N., 11° 28′ E.), town, Bavaria, Germany; large breweries. Pop. 12,000.

KULU (32° 4′ N., 77° E.); region, Punjab, India; fruits; thermal springs. Pop. 70,000.

KUMAON, KUMAUN (30° N., 79° 20′ E.), division, United Provinces, India; great part occupied by S. Himalayas; forests yield valuable timber. Pop. 1,210,000.

KUMASI, COOMASSIE (6° 40′ N., 2° 16′ W.), capital, Ashanti, Brit, W. Africa; destroyed by Brit. force under Sir Garnet Wolseley, 1874; again occupied, 1896; Gov. and Brit. force besieged, but relieved, 1900; has fort; trading center. Pop. 10,000.

KUMBHAKONAM, CONBACONUM (10° 58′ N., 79° 25′ E.), sacred city, Tanjore district, India, in Cauvery delta; formerly capital of Chola kingdom; brass and metal ware. Pop., 1911, 60,000.

KUMTA (17° 43′ N., 74° 11′ E.), town, Bombay, India. Pop. 11,000.

KUN, BELA, Hungarian Communist leader, a Russian Jew by birth (Eng. Cohen) and a tailor by occupation; he organized a revolutionary rising at Budapest, Feb., 1919; after resignation of Karolyi cabinet became commissary for for foreign affairs in the Hungarian Soviet Government, March; had negotiations with General Smuts on behalf of Allied Peace Conference, April; recognition refused; concluded military alliance with Russian Soviets; government overthrown, Aug.; fled to Vienna; interned in Austria; released in exchange for Austrian prisoners in Russia, July, 1920.

KUNAR (34° 25′ N., 70° 30′ E.), river, Afghanistan; has its source in S. slopes of Hindu-Kush Mountains, and joins Kabul R. near Jelalabad.

KUNDUZ (36° 20′ N., 70° 30′ E.); town and khantate, Afghanistan.

KUNERSDORF (52° 22′ N., 14° 37′ E.), village, Brandeburg, Prussia; Prussians defeated by Austrians and Russians, 1759. Pop. 5,000.

KUNGUR (57° 21′ N., 57° 13′ E.); town, E. Russia. Pop. 15,000.

KUNZ, GEORGE FREDERICK (1856), mineralogist and specialist on precious stones; *b.* New York City. He studied at Cooper Union after a public school education, and later received degrees from Columbia, Marburg University and Knox College. He became an authority on precious stones, and as such joined the firm of Tiffany & Company. His publications embrace numerous brochures on gems, mineralogy, and meteorites, and he reported annually, as special agent of the U.S. Geological Survey, on the occurrence of precious stones in the country's mineral resources. Several European countries conferred orders upon him.

KUOPIO.—(1) (63° 10′ N., 28° 30′ E.), province, Finland; area, 16,500 sq. miles; cereals, cattle, iron. Pop. 314,000. (2) Cathedral town; capital of above. Pop. 14,500.

KUPRILI, MUHAMMAD (*c.* 1585-1661), Turk. statesman; app. grand vizier, 1656; put down Spahi revolt; defeated Venetians and took Tenedos, 1657; subdued Transylvania; organized finances. His *s.*, Ahmed (*c.* 1632-76), was also grand vizier; warred against Poles. Another *s.*, Mustafa (*d.* 1691), was grand vizier, in 1689; slain at *Salankamen.* Hussein (*d.* 1702), was grand vizier under Mustafa II.; negotiated Treaty of Carlowitz, 1699.

KURDISTAN (39° N., 42° E.); extensive mountainous region of W. Asia, extending southwards from the river Araxes to the plains of Mesopotamia and the mountains of Luristan, and from the Euphrates E. to Urmia in Persia. Area *c.* 52,000 sq. miles. Much of it is grass-covered tableland where sheep are raised in large numbers. Watered by tribs. of Euphrates and Tigris. Inhabitants are the turbulent and savage Kurds —conquered in turn by Persians, Macedonians, Parthians, Sassauians, Romans Turks—of middle stature, powerfully built, with regular features and abundant brown or black hair. Notorious for massacres of Armenians. Divided into large number of small tribes, each under

hereditary chief. Mohammedans of the Sunnite sect; formerly all nomads, but even those who take to agricultural pursuits often migrate to distant pastures in summer. Pop. *c.* 2,500,000.

During World War, Kurdistan was involved in the Russo-Turk. fighting. By the Treaty of Peace submitted to Turkey that power accepted in advance a scheme of local autonomy for the predominantly Kurdish areas E. of the Euphrates, S. of the S. frontier of Armenia as eventually fixed, and N. of the S. frontier of Turkey, to be drafted by a British-French-Italian Commission. As Turkey did not sign this Treaty it did not go into effect, and Kurdistan, though normally a republic, remained under the control of Turkey.

KURGAN (55° 32′ N., 65° 30′ E.), town, W. Siberia. Pop. 11,000.

KURIA MURIA ISLANDS (17° 30′ N., 56° E.), high rocky islets (British), off Arabian coast.

KURILES (*c.* 47° N., 154′ E.), series of 32 small volcanic islands between Kamchatka and Japan, belonging to latter, to whom they were ceded by Russia, 1875; area, *c.* 6,156 sq. miles; largest are Kunashiri, Iturup; generally infested by fog; numerous hot springs; seal-hunting carried on. Pop. *c.* 4,500.

KURNOOL.—(1) (15° 33′ N., 78° 5′ E.), district, Madras, India; area, *c.* 7,550 sq. miles. Pop. 875,000. (2) (15° 47′ N., 78° 5′ E.), town. Pop. 26,000.

KUROKI, COUNT (1844), Jap. general; won great distinction in Chino-Jap. War, 1894; in Russo-Jap. campaign, 1904, commanded the 1st Jap. Army and won the victory of Kiu-lien-cheng, which had the effect of isolating Port Arthur; was one of the generals in command at Mukden. He wrote *The Russian Army and the Japanese War, 1909.*

KUROPATKIN, ALEXEI NICOLAEVICH (1848-1921), Russian general; chief-of-staff in Russo-Turk. War, 1877-8; appointed to reorganize the Russian army, 1882; commander-in-chief during first part of Russo-Jap. War, but relieved at his own request, 1905; at the outbreak of the World War, was commander-in-chief of the Manchurian army, and, in 1916, was appointed commander-in-chief on the the N. front; attempted an advance at Jacobstadt on the Dvina, but failed owing to enemy's preponderance in ammunition; transferred to governor-generalship of Turkestan, 1916; reported arrest by Committee of Soldiers Delegates, 1917; distinguished for care of his men and for administrative ability.

KURRACHEE. See KERACHI.

KURRAM (33° 30′ N., 70° 30′ E.), river, N.W. Frontier Province, India; tributary of Indus; gives name to district, with area, 1,280 sq. miles. Pop. 56,000.

KURSK.—(1) (51° 20′ N., 36° E.), government, Central Russia; area, 17,937 sq. miles; surface generally level, hills in E.; produces cereals, tobacco, wool, leather. Pop. 3,200,000. (2) (51° 44′ N., 36° 13′ E.), town; capital of above; Gk. Episcopal see; cathedral. Pop. 85,000.

KURUNTWAD (16° 42′ N., 74° 30′ E.), feudatory state, Bombay, India. Pop. *c.* 80,000.

KUSTANAISK, town, Turgai, Asiatic Russia. Pop. 15,000.

KUTAIAH, KUTAYA (39° 26′ N., 29° 52′ E.), town, Asia Minor. Pop. 41,000.

KUTAIS (42° 21′ N., 42° 50′ E.), town and government; area, 8,166 sq. miles, Transcaucasia Russia; ruined cathedral. Pop. 40,000; government, 990,800.

KUT-EL-AMARA (32° 33′ N., 45° 40′ E.), town, Mesopotamia, almost insulated by Tigris, which forms a deep U-shaped loop about it, with the river *c.* 250 yards broad on all sides save one, which is 3,200 yards across and affords only land approach to the town. Place described as 'a collection of mud huts thrown together, with winding alleys and narrow passages, all open to the winds and rains and burning sun.' Was captured by General Townshend in the course of his advance towards Bagdad, redoubts being stormed by 2nd Dorsets and Indian troops, Sept. 27, 1915. After Townshend's expensive victory at Ctesiphon, he retreated to Kut, and by Dec. 6, was entirely surrounded; Nur-ed-Din, Turk. commander, demanded surrender; this was refused; town heavily bombarded from three sides and attacks made against isthmus. On Christmas Eve enemy breached parapet and got inside, but was driven out again; asked for armistice to bury dead on 29th, and thereafter made no more infantry attacks, having already lost 4,000 men, but left hunger to do its work. Early in Jan., 1916, General Townshend telegraphed cheery messages, and much was expected of Aylmer's relief force. Bad weather, however, made advance either by land or water impossible until Jan. 17; four days later an ineffectual effort was made to break the Turk. lines, but bad weather again suspended operations until early in March, when the relief force was reorganized and placed under command of General Gorringe. By March 17, the enemy had been forced back, and the

relieving force was about 14 miles below Kut. Further progress could not be made, and the fate of the garrison at Kut was sealed.

From Christmas Day, 1915, onwards, the besieged began to suffer the pangs of hunger; occasionally aeroplanes dropped certain requisites, and on the night of April 24-25, the steamship *Julnar* made a gallant but fruitless attempt to break through the Turkish cordon and bring relief. By this time the garrison (2,970 British and 6,000 Indians) was so reduced by famine and disease that Townshend reluctantly surrendered, April 27, 1916. General Townshend made three fruitless attempts to escape. After the fall of Enver Pasha, the new Turkish Government sought his aid in making peace arrangements.

KUTTENBERG (49° 57′ N., 15° 17′ E.), town, Bohemia; disused silver mines; manufactures tobacco, sugar, textiles; old royal castle, several Gothic churches. Pop. 16,000.

KUWÉT (29° 19′ N., 48° E.), seaport, head of Persian Gulf, Arabia. Pop. *c.* 15,000.

KUYP. See CUYP.

KWANGCHOW BAY (21° 28′ N., 109° 35′ E.), bay and harbor, Kwangtung, China; leased to France, 1898.

KWANG-HSU (1875-1908), Emperor of China; *b.* in 1871. Although he was nominally the ruler, the Empress Tze-Hsi really had the power, and constituted herself regent, after having succeeded in putting him on the throne. In 1898, although she had retired from power, she compelled him to issue an edict again making her regent, and this influence she exercised until the end o his reign.

KWANG-SI (24° N.; 108° 30′ E.) province, S. China; area, 77,200 sq. miles Pop. 5,200,000.

KWANG-TUNG (23° 30′ N.; 114° E.) province, S. China; area, 99,970 sq. miles surface mountainous; capital, Canton produces silk, tea, sugar, coal, iron, gold Pop. *c.* 31,865,000.

KWEZA (9° 16′ S.; 13° 22′ E.), river, Zngola, W. Africa; enters Atlantic.

KWEI-CHOW (27° N., 106° 30′ E.) province, S.W. China; area, 67,160 sq miles; produces quicksilver. Pop 7,600,000.

KYAUKPYU (1) (19° 25′ N.; 94° E.), district, Lower Burma; area, 4,38 sq. miles. Pop. 172,000. (2) (9° 22′ N. 93° 40′ E.), town, K. Pop. 3,500.

KYAUKSÉ (*c.* 21° 42′ N., 97° 12′ E.) town, Burma. Pop. *c.* 6,000. Distric (Ko-Kayaing) has area, 1,274 sq. miles Pop. *c.* 145,000.

KYD, THOMAS (1558-94); Eng dramatist; first important work was *Th Spanish Tragedy*. His next surviving work of merit, *Soliman and Perseda*, als a tragedy, showed the same 'blood an thunder' and bombast.

KYFFHÄUSER (51° 26′ N.; 11° 6′ E.) forested hills, Thuringia, Germany; ruin of two old castles.

KYRIE, ELEISON (Gk. 'lord'), words 'Lord, have mercy upon us,' used i various liturgies.

KYSHTYM (55° 44′ N., 60° 30′ E.) mining town, Perm, Russia. Pop. 14,000

L

L, 12th letter of Eng. alphabet; a 'front palatal,' usually termed a 'liquid'; evolved from Phœnician 'ox-goad' character.

LAALAND, or **LOLLAND** (low land) an island of Denmark S. of Seeland at the southern entrance to the Great Belt, with an area of about 460 sq. m. It is about 36 miles long and from 9 to 17 miles wide, The surface is very flat and the soil fertile. Capital Maribo. Produces corn, hops, beans, timber, hemp, etc. Pop. 75,000.

LA BADIE, JEAN DE (1610-74), Fr. theologian; joined Reformed Church; preacher in Geneva, London, and Amsterdam; became severe disciplinarian; believed in communism, and that believers should form a community apart.

LABARUM, the name applied to the sacred military standard of the early Christian Roman emperors. Constantine the Great was the first to use it to commemorate his miraculous vision in 312. It had the form of a long gilded spear or staff, with a bar crossed at the top, with a square purple cloth, richly jeweled, depending from it. On the point of the spear was the sacred monogram formed of the first two letters of the name of Christ, encircled by a golden wreath. The cross was substituted for the Roman eagle.

LA BASSÉE, tn.; dep. Nord, France (50° 32′ N., 2° 48′ E.), 12 m. S. W. of Lille; early in the World War became scene of violent fighting; during the race to the sea, Oct., 1914, the British strove in vain to turn the Ger. flank in this region; subsequently the Germans attempted to break through towards Béthune and the Channel ports, Oct. 22 to Nov. 2, 1914. In the four years of trench warfare there was much fighting on both sides of the Béthune-La Bassée Canal; early in Oct., 1918, the advance of Plumer and King Albert to the N. and the advances of Haig to the S. forced the Germans to evacuate the district. The town was utterly ruined by the guns of friend and foe.

LABIATÆ, the name given to an important order of dicotyledonous plants, consisting of about 3,000 species which thrive in all parts of the world. The species are herbaceous or shrubby, the majority are land-plants, but a few are found in marshes; they are characterized by their square stems and opposite decussate leaves as well as by the flower. The inflorescence is a verticillaster of bilabiate ringent flowers; the sepals and petals are each five in number and united, there are four didynamous and epipetalous stamens, the superior ovary consists of two united carpels and is quadrilocular; the fruit is a carcerules. Some of the chief genera are *Lamium,* (*e.g.*) deadnettle, *Salvia,* (*e.g.*) sage, *Mentha,* (*e.g.*) thyme.

LABICHE, EUGÈNE MARIN (1815-88), a French dramatist; *b.* and *d.* at Paris. In 1838 he published a novel entitled *La Clef des Champs,* and in the same year he made a double venture on the stage with a drama, *L'Avocat Loubet,* and a vaudeville, *Monsieur de Coislin ou l'homme infiniment poli,* both of which found popular favor. In 1851 appeared his farce, *Un Chapeau de paille d'Italie,* a fine specimen of French imbroglio, followed by *Embrassons-nous, Folleville, Un Garcon de chez Very, Le Voyage de M. Perrichon, La Cigale chez les Fourmis,* and several others.

LABICI (41° 47′ N., 12° 45′ E.); old town, Latium, Italy; on site is modern Monte Compatri.

LABIENUS, TITUS, Rom. soldier and statesman; at first on Cæsar's side in Civil War, then joined Pompeius; killed, 45 B. C.

LA BOISSELLE, vil.; France (50° 2′ N., 2° 42′ E.). In World War was the scene of fierce fighting during July, 1916.

LABOR ARBITRATION, a means to settling amicably disputes between labor and capital, through joint boards, or committees, which may be permanent or temporary, limited to one establishment, or covering a whole industry. An

example of a voluntary institution of this kind is found in the electrical industry in the United States and Canada, consisting of a council on industrial relations, composed of ten members, five from the workers organization and five from the employers organization. In case of a dispute this body forms boards of conciliation. The plan is entirely voluntary, being simply a court to which either side may appeal. In 1921 it reported having settled 90 disputes without the loss of a day's work. Boards of arbitration are also created by legislation. A compulsory Court of Arbitration was thus established in Kansas, which was in operation during 1920-21, but was a decided failure, the workers seeing in it a principle whereby organized capital would coerce labor through the power of the government. The Railroad Labor Board is an example of such a body, established by the Federal Government, but is entirely voluntary, the disputants not being compelled to abide by its decisions legally. Such boards have been established by many of the states. On the whole, they have proved themselves a failure, probably due to the growing radicalism within the ranks of labor, which is growing discontented with the system of industry rather than with particular conditions, this discontent being undoubtedly due to the proven experience that a rise in wages is followed automatically by a rise in prices, the workers themselves paying for the bettered conditions as consumers.

LABORATORY, a building in which investigations and experiments in chemistry, physics and other sciences are carried on.

LABOR BANKS. A significant economic effect of the World War in United States was establishment by leading trades unions of a number of labor banks in various parts of the country. These institutions are conducted on co-operative principles, the capital stock being held by the unions and their members, the latter being also the depositors in addition to those of other unions and the general working public. The dividends declared are strictly limited, as is also the amount of stock held by one individual, and the depositors receive a share of the profits as well as interest on their accounts. In April, 1923, ten of these labor banks were in operation, and thirteen others were projected. The development began in 1920 with the foundation of the Brotherhood of Locomotive Engineers of the Engineer's Co-operative National Bank at Cleveland, Ohio, with a capital stock of $1,000,000 and reserves of $15,547,402. The same year saw the establishment of the Mount Vernon Savings Bank, with a reserve of $2,689,182, at Washington, D. C., by the International Association of Machinists. Railroad workers next entered the banking field, 1921, with the Brotherhood Trust and Savings Bank, operating at San Bernardino, Cal., on a capital stock of $200,000, and reserves of $770,000, while various labor groups the same year opened the Co-operative Bank and Trust Company at Tucson, Arizona, with a capital stock of $70,000, and reserves of $262,000. The Amalgamated Clothiers of America followed in 1922 by forming the Amalgamated Trust and Savings Bank of Chicago, with a capital stock of $200,000, and reserves of $1,291,441, and in 1923 established another institution in New York City, namely, the Amalgamated Bank. Other labor banks thereafter came into being, among them a bank at Cincinnati, Ohio, controlled by the Brotherhood of Railroad and Steamship Clerks, and the Federation Trust of New York City, under the joint auspices of the Central Trades and Labor Council and the New York State Federation of Labor, each with a capital of $1,000,000.

The resources of American labor unions long since reached a volume that enabled their officials to become accustomed to handling and investing large sums of money, and none of the leading organizations therefore are novices in high finance. In determining to be their own bankers the unions were animated by the conviction that the workers themselves, not the regular banks, should profit by the earning power of their savings. The Amalgamated Clothier Workers in New York City, for example, have an earning capacity approximately $2,500,000 weekly, a large proportion of which hitherto went as savings into other banks, though no single account was large. The war, with its unparalleled influence in stimulating higher wages and the cost of living, led to the discovery that labor was not making the best use of its growing opulence. An indication of what might be termed both labor's buying and saving power in 1923 was furnished by the National Industrial Conference Board, which reported in April that average money wages were then 105 per cent. above the pre-war level, and average real wages, that is, money wages adjusted to changes in the cost of living, were 30 per cent. above the pre-war figure. The figures, representing weekly earnings, were based on a survey of twenty-three manufacturing industries employing more than 600,000 workers, and were accepted as representative of labor conditions the country over. The labor banks they developed under

conditions that made labor's purchasing power about a third greater than it was in the period before the war, and as 1923 progressed labor's resources tended to increase by further expansion in wages in excess of the ratio at which the cost of living advanced.

Labor nevertheless held that the rise in the cost of living was disproportionate to its wage advances. It determined, by the formation of banks, to share indirectly in the earnings and profits of industry arising from greater living costs, to offset out-of-pocket losses due to high prices by utilizing its savings in some form of joint stock control, and obtained this by becoming bankers and purveyors of credit with its surplus capital. It set out to invest its accumulated savings in bonds (the first mortgages on industry) through its own banks, which also made commercial loans with labor's savings as part of their regular banking business.

Labor decided to control its own credit and thus opened up a new era in its relations with capital, which in its turn had long encouraged workers in joint-stock manufacturing concerns to invest their savings in the industry that employed them. The entrance of labor into banking and its continued expansion in that field held out the prospect of a fundamental change in the character of trade unions. The success of their banks was deemed as likely to weaken if not eliminate the tendency to socialism and communism, always most manifest in the unions, since the fostering of revolutionary doctrines and the founding of successful banks cannot go hand in hand. Moreover, by capitalizing its stake in America, labor is closely following the footsteps of capital in traveling a road by which capital itself became strong.

LABOR CONFERENCE, INTERNATIONAL, a yearly conference of labor representatives held under the auspices of the International Labor Organization of the League of Nations. It represents the activities of the International Labor Office, which is in charge between conferences, first located in London, but in 1920 removed to Geneva, Switzerland. The first general conference was convened by the United States Government, in Washington, during October, 1919. Forty-one countries were represented through governmental employers and labor delegates. The conference passed a number of decisions, each country being pledged to pass legislation embodying them. The chief questions considered were the limitations of the hours of labor to 48, regulating the employment of women and children, and insurance against unemployment. The Second Conference was held in Geneva, in 1920, and considered especially the condition of seamen. The Third Conference, held in 1921, concerned itself chiefly with problems pertaining to the disturbing labor situation then developing in all industrial countries.

LABOR CONGRESS, international conventions of delegates from labor unions. The first of these was held in 1847, at which were represented radical labor organizations initiated by Karl Marx and his followers, giving birth to the famous First International, which was, however, shortlived. The first purely labor congress was held in Geneva, Switzerland, in 1860, by delegates from the labor movements in England, France, Germany and Holland. Others followed at Basle, in 1869; Dresden, 1871; the Hague, 1872; Paris, 1886; Berlin, 1891; and Zurich, Switzerland, 1897. Up to the World War the scope of these congresses and the loose international organization they represented was extremely limited, the collection of statistics and the passing of resolutions being their chief functions. Since the war there have been many international congresses of workers in special industries, such as that of the agricultural workers, in Amsterdam, in 1920; the bookbinders, held in Berne, Switzerland, in 1920; the Clothing Workers, in Copenhagen, in 1920, and many others. An International Congress of Working Women was held in Washington, D. C., in October, 1919. In that year a Pan-American Labor Congress was held in New York, at which were representatives of labor unions in the United States, Canada, Mexico and nearly all other Spanish-American countries.

LABOR DAY. The first Monday in September. A legal holiday in all states, but not in the District of Columbia, Porto Rico, Hawaii, and Alaska. It was inaugurated with a parade by the Knights of Labor in 1882. Workingmen agitated to have the day declared a legal holiday and Colorado passed a law to that effect March 13, 1887. New York, New Jersey, and Massachusetts followed. Labor Day in Europe is on May 1 and was inaugurated by a demonstration in favor of an 8-hour day in 1890.

LABOR, DEPARTMENT OF, a department of the United States Government, the secretary of which is a member of the President's Cabinet. The Bureau of Labor was originally created in 1888, and was under the Department of the Interior. In 1903 it was transferred to the Department of Commerce and Labor.

Under an Act of Congress, passed in 1913, it was made a separate department. Since then it has included a Labor Bureau, the Bureau of Immigration, the Bureau of Naturalization, the Bureau of Labor Statistics, the Children's Bureau, the Women's Bureau and the Bureau of Industrial Housing. One of the chief functions of the Department is to investigate industrial conditions and gather statistics, especially in fields involved in strikes or other disputes between capital and labor, the results of which are issued to the public in monthly bulletins. Through the Bureau of Immigration, which maintains local offices in all ports of entry, the immigration laws are enforced. The Bureau of Naturalization keeps records of all declarations of intentions and applications for citizenship. The Children's Bureau gathers statistics on infant mortality, child life, juvenile courts, delinquency, etc., while the Woman's Bureau makes a study of state legislation in regard to women in industry. In 1924 the Secretary of Labor was James J. Davis, of Pennsylvania.

LABOR LEGISLATION, laws which are based on the assumption that the wage earner needs special consideration from the government on account of his social status. This principle has been gradually encroaching on the old assumption that there should be no interference with the 'freedom of contract,' reducing the latter to an antiquated idea. The first labor laws were those passed in Great Britain, nearly a hundred years ago, regulating the employment of workers in factories. In this country New York passed a law exempting a man's wages from claims for debt, as far back as 1830. In 1842 Massachusetts passed laws regulating the hours of labor for children under 12, limiting their work to 10 hours a day, and extending these provisions to women in 1847. The Chinese Exclusion Law, of 1882, and the later Immigration Laws serve as examples of Federal legislation in behalf of the laboring classes, but largely such laws are limited to the individual states. A multitude of such laws have been passed by the states, many of them through the influence of the American Association for Labor Legislation, with headquarters in New York City, but most of them are due to the growing pressure of the labor organizations. During the past few years, since 1920, when Congress passed the Vocational Reeducational Act, considerable progress has been made in this field of labor legislation. In 1920 the Federal Government appropriated $750,000 and in 1921 and 1922 $1,000,000 each year, to be apportioned among the states on condition that each state make an equal appropriation, for the purpose of training people crippled in industry for new vocations. About a dozen states accepted the offer.

LABOR ORGANIZATIONS, associations of wage workers, banded together for the purpose of maintaining and increasing wage standards, and in other ways bettering working conditions within the industries covered. These are of two distinct classes; trade unions, associations of men or women engaged within one class of occupation, such as carpenters, plumbers, metal polishers, etc.; and industrial unions, including all classes of labor within one industry, as transport workers, textile workers, railroad employees, etc. The former class of organization is usually conservative in character, desiring no change in the fundamental basis of the present system of industry, and demanding only to maintain or raise wages, the reduction of the hours of labor, etc. The industrial union, represented in the United States by the Industrial Workers of the World (I. W. W.), is usually based on the syndicalist philosophy, looking forward to a radical change in the industrial structure, in which each industry shall be governed autonomously by the workers employed in it. In the United States the trade union form of organization, represented in the American Federation of Labor, still predominates. In 1923 the membership of its affiliated locals numbered 3,600,000, as compared to about 100,000 members of the I. W. W. Aside from these two forms, however, there is a third, partaking of the character of both, and affiliated with neither. These are the railroad brotherhoods; the Locomotive Engineers, the Locomotive Firemen and Enginemen, of Railroad Trainmen, etc., strongly organized bodies of skilled workers, conservative in character, with aims similar to those of the trade unions, but more exclusive.

LABORI, FERNAND GUSTAVE GASTON (1860-1917), Fr. advocate; won fame by his brilliant defense of Zola, on a charge of libelling the executive and army, 1898, and by his conduct of the Dreyfus appeal at Rennes, 1899; counsel for the defense in the Humbert trial, 1903, and in the trial of Mme. Caillaux. He was founder and editor-in-chief of the Grand Revue.

LABOUCHERE, HENRY DUPRÉ (1831-1912), English journalist; entered the diplomatic service, 1854, but left it to take up politics, 1864; M.P. for Middlesex, 1867-8, and for North-

ampton, 1880-1905; was Daily News correspondent in Paris during the siege of 1870-1; founded and became editor and proprietor of Truth, 1876, a society journal which was successful in the exposure of a number of social, financial, and administrative scandals.

LABOULAYE, EDOUARD RENÉ LEFEBVRE DE (1811-83), a French author, jurist, and politician, *b.* at Paris. He entered the bar in 1842; in the following year was elected a member of the Academy, and in 1849 became professor of jurisprudence at the College of France. In 1855 he edited the Revue historique de Droit, continuing to do so till 1869. From 1870-76 he was editor of the Revue de Législation, and from 1877-83 of the Nouvelle Contes bleus, Contes amusants, fins et spirituels, L' Evangile de la Bonté, Souvenirs d'un Voyageur, and numerous works on French law.

LABRADOR, great peninsula, N. America (50°-60° N.; 55°-80° W.), between Hudson Bay and Strait and the Gulf of St. Lawrence; narrow strip of coast from Cape Chudleigh to Strait of Belle Isle is under Newfoundland government; remainder assigned by Dominion of Canada to Quebec, which incorporated Ungava (*c.* 450,000 sq. m.) in 1912. Surface is mainly a plateau, 2,000 ft. above sea-level; area, *c.* 520,000 sq. m.; crossed by many rivers, flowing to Atlantic and Hudson Bay. Along Atlantic coast cod, salmon, and herring fishing and sealing are important industries during summer. Pop. *c.* 15,000. Labrador was acquired by Britain in 1763. Part controlled by Newfoundland has area of 120,000 sq. m.; pop. 4,000.

LABRADORITE, a soda-lime felspar of the plagioclase group, mostly bluish and greenish in color, abundant in St. Paul's Is., Labrador. Used in jewelry.

LA BRUYÉRE, JEAN DE (1645-96), Fr. prose author of classical age; advocate in *Parlement* of Paris, 1667-73; Treasurer of Finances at Caen, 1673-87; tutor to Duke of Bourbon, Great Condé's grandson, 1684-86; remained in house of Condé attached to person of Duc d'Enghien, Great Condé's *s.*, and studied the world, which he depicted in his *Caracteres* (first edition, 1668). Book contained 420 separate *caracteres*, or portraits, or thoughts constituting a whole; the 8th edition, pub. before the author's death, contained 1,120 *caracteres*. La B. was admitted to Fr. Academy, 1693; depicted his acquaintances with such skill as to win immediate renown; some of his wit keeps its savor, but greater part has perished.

LABUAN (5° 25′ N., 115° 18′ E.), island and Brit. crown colony, off N. W. Borneo, Malay Archipelago; produces large quantities of sago; considerable transit trade between Borneo and Singapore; acquired by Britain, 1846; incorporated with Singapore, 1907. Pop. 7,000.

LABURNUM, a genus of leguminous plants, contains only three species; they are natives of Europe and Asia and one is common in British shrubberies. This is *L. vulgare*, which is noted for its pendulous racemes of beautiful yellow papilionaceous flowers, and in all its parts is highly poisonous.

LABYRINTH, a maze or series of intricate passages through which it is difficult to find one's way. The L. of Crete was said to have been built by Dædalus for King Minos. Here was kept the Minotaur. Recent excavations in Crete have revealed what may have been the L. of Minos. The Egyptian L. was situated not far from Crocodilopolis, above Lake Moeris in the district of the Fayum. It contained about 3,000 rooms, and was half under and half above the ground. It was visited by Herodotus and Strabo, and was mentioned as one of the wonders of the world. The Clusium L. in Italy was built by the Etruscans as a sepulchre for King Porsenna. L's were also in existence at Lemnos and Samos, but their sites have not been discovered. Other L's existed at Nauplia, Sypontium, Italy, and at Val d'Ispica, Sicily.

L's in gardens are known as mazes, and are generally constructed of privet hedges so arranged that it is difficult for the visitor to find his way to the center, or out again.

LAC, resinous exudation produced by insect puncture from branches of certain East Ind. trees; becomes *shellac* when purified by water.

LAC, or **LAKH,** derived from a Sanskrit word *laksha*, meaning 'one hundred thousand.' Generally used in India to signify 100,000 rupees, the nominal value of which is $50,000; the real value $33,330.

LACAILLE, NICOLAS LOUIS DE (1713-62), Fr. astronomer; made catalogue of 10,000 stars of southern hemisphere; numerous works on geometry, astron., and optics.

LA CARLOTA (10° 22′ N.; 122° 54′ E.), town, Negros, Philippine Islands. Pop. *c.* 20,000.

LACCADIVE ISLANDS (11° 20′ N.; 72° 30′ E.), group of 14 coral islands in Ind. Ocean, off W. coast of Madras;

area, *c.* 78 sq. miles; discovered by Vasco da Gama, 1498; belong to Britain; produce cocoanuts, coir, bananas, tortoise-shell. Pop. 10,500.

LACE is an ornamental design carried out in linen, silk, cotton, gold, silver, or composite thread. It is made by needle, pillow and bobbins, or machinery. The products of the two first methods, (*i.e.*) 'needle-point' and 'pillow-lace,' are known as 'real' lace. The art of l.-making seems to have been learned by Venice from the East, and was a natural development as a branch of embroidery. Point l., the first appearance, originated from (1) the darning of patterns on fine net. This was called by the Italians *punto a maglia*, by the Fr. *lacis*, whence our 'lace'. In both point and pillow lace many succeeding kinds have a net background, others, such as guipures, being without. The net background of l. is known as *reseau*, or, when spotted, *reseau rosace*. The design is worked on the *reseau* with the needle or stitched on it (*applique*) after completion. Other sources of l. were (2) cut-work (Ital. *punto tagliato*) and drawn-thread work (Ital. *punto tirato*)—these, now more usually classified as embroidery, were then embellished with embroidery; and (3) simply twisted threads used for personal decoration known as l's.

Among the most fashionable of l's is Venetian point. Irish point is highly prized, and artificial efforts are being made to stimulate the general production of Irish l. Pillow-l., invented in either Italy or Flanders, was produced in the early XVI. or possibly late XV. cent.; a Flemish painting of this date (variously ascribed to Quentin and Jean Matsys) has the added interest of showing this occupation. The pattern is placed on a pillow on the l.-maker's lap, and the l. is made by plaiting and twisting threads with the aid of bobbins and pins. The background of either kind is now always made with machinery. The reticulated l., so-named because its design was based on the square or oblong of the old drawn or cut work, characterized late XVI. and early XVII.-cent. l. It was only in the XVII. cent. that the worker's skill sufficed for the introduction of Renaissance ornament; the circle and classical scroll (particularly suitable for borders) with rosette and leafage almost entirely replaced the square as the foundation of the design. The garland, shell, and other devices, which afterwards became a matter of mechanical imitation, also appeared, while at the same time every delicate design of free foliage was evolved. Louis XIV. gave great encouragement to this industry, and in the second half of this cent. Alençon and other Fr. towns won their fame. Venice l. of the XVIII. cent. retained its excellency, but, like most Fr. ornament of this period, Fr. l. became both trivial and heavy, and the simple Valenciennes little made up for the lost glories of point d'Alençon or point d'Argentan. Brussels, Mechlin, and Honiton pillow-l's are famous varieties.

LACEDÆMON (37° 5′ N.; 22° 30′ E.), department S. E. Peloponnesus, Greece; formerly another name for Laconia. Pop. 90,000.

LACHAISE, FRANÇOIS D'AIX DE (1624-1709), a Jesuit priest, father confessor of Louis XIV., *b.* at Aix in Forey. L. had the reputation of a man of broad views and upright character, and always avoided extreme courses. Was a friend of Fénelon, fond of antiquarian pursuits, and a man of some learning, and founded the College of Clermont. On the property acquired by his order in 1826 stands the cemetery of Père Lachaise in Paris, called after him.

LA CHAUSSÈE, PIERRE CLAUDE NIVELLE DE (1692-1754), a French dramatist, *b.* at Paris, and the originator of modern French drama. Produced his first play, *La Fausse Antipathie*, in 1734, followed in 1735 by *Le Prejuge a la Mode*, and in 1737 by *L'Ecole des Amis*. He also wrote: *Melanide*, *L'Ecole des Meres*; *La Gouvernante*; *L'Ecole de la Jeunesse*, and several *Contes* in verse. In his plays La C. combined the tragedy of common life and pathetic comedy, a type named *comedie larmoyante*, and Voltaire maintained that this pointed to the fact that La C. was unable to write either of the recognized kinds of drama.

LACHES, legal term for negligence or dilatoriness in the performance of an act which a man is bound by law to perform.

LACHINE (45° 28′ N.; 73° 40′ W.), town, Quebec, Canada; connected with Montreal by L. Canal. Pop. 5,600.

LACHISH (31° 34′ N., 34° 45′ W.), town, Palestine; remains of eight different cities have been excavated; ruined by Joshua in Old Testament times.

LACHLAN, a riv. of New South Wales, rising in King's co. and joining the Murrumbidgee, a trib. of the Murray. Extensive marshes are found at the latter part of its course, and in the rainy season it is navigable for a considerable distance by small steamers. It is 700 m. long.

LACINIUM (39° 4′ N., 17° 13′ E.), cape, Italy; site of celebrated temple of Hero Lacinia, of which one column remains; modern, Capo delle Colonne.

LACKAWANNA, a city of New York, in Erie co. It is on the Pennsylvania, the Buffalo, Rochester and Pittsburgh, Lake Shore and Michigan Southern, the Lehigh Valley, and other railroads. It is an important industrial city and has plants for the manufacture of steel, bridge works, blast furnaces and coke. Its public institutions include St. John Protectorate, an orphan asylum and a hospital. Pop. 1920, 17,918.

LACKAWANNA RIVER. An important stream that rises in the northeastern part of Pennsylvania and flows through the valley between the Shawnie and Moosie mountains. It is about fifty miles long. The valleys nearby are rich in anthracite coal, and the entire region contains many rolling mills, furnaces, and factories. Scranton is the principal city on the river.

LA CLOCHE, JAMES DE (*c.* 1644-69), impostor who claimed to be natural *s.* of Charles II of England; came from Jersey to Rome, 1668; by means of forged letters supposedly written by Charles II. obtained money from Oliva, Jesuit general; disowned by Charles, 1669; identity unknown.

LACONIA, a city of New Hampshire, in Belknap co., of which it is the county seat. It is on the Boston and Maine Railroad and on both banks of the Winnepasaukee River. It is a well known summer resort and has also important industries, including the manufacture of railroad cars, lumber, hosiery, machine shop products, paper boxes, etc. It is the seat of the State Home for Feeble Minded, Home for the Aged, and has a hospital, a public library and a park. Pop. 1920, 10,897.

LACORDAIRE, JEAN BAPTISTE HENRI DOMINIQUE (1802-61), a French preacher, *b.* at Racey-sur-Ource, Côte-d'Or. He studied for some years at Dijon, where he distinguished himself by his rhetoric, and afterwards became famous as an advocate in Paris; but in 1823, having read Lamennais's *Essai sur l'Indifference,* was converted to Roman Catholicism and entered the seminary of Saint Sulpice. He was ordained priest in 1827 and chaplain to a convent and to the College Henri IV. He assisted Lamennais in the editorship of *L'Avenir.* In 1838 he set out for Rome, where he joined the monastery of Nunciva, assuming the name Dominique, and prepared his *Memoire pour le retablissement en France de l'ordre des Freres Precheurs,* and collected materials for his *Life of St. Dominic.* His principal works are: *Considerations sur le System Philosophique de M. de Lamennais,* 1834; *Memoire pour le retablissement en France de l'ordre des Freres Precheurs,* 1839; *Vie de Saint Dominique,* 1841; *Conferences de Notre Dame de Paris,* 1835-51; *Conferences de Toulouse,* 1854.

LACQUER, LACKER—(1) shellac varnish for metals; prevents tarnishing. (2) varnish of Jap. *lacquer-ware*; juice of l. tree.

LACROIX, PAUL (1806-84), Fr. writer, under pseudonym P. L. Jacob, Bibliophile, of many hist. romances, plays, histories, biographies, etc.; chief merit lies in his history of Fr. manners from Middle Ages onward.

LACROMA (42° 37′ N., 18° 7′ E.), island, Adriatic Sea, belonging to Austria.

LA CROSSE, a city of Wisconsin, in La Crosse co., of which it is the county seat. It is on the Chicago, Milwaukee and St. Paul, the Chicago, Northwestern, and other railroads, and on the Mississippi River. The surrounding country forms an extensive farming and dairying area of which La Crosse is the center. It has also important industries including the manufacture of agricultural implements, automobile parts, stoves, lumber, shingles, and lath. It is the seat of the Asylum for Chronic Insane, and a Marine Hospital. It has a public library. Pop. 1920, 30,363.

LACROSSE, a ball-game which originated in Canada, and is now extensively played in the United States and other countries; played with a long stick (5 to 6 ft.) looped at the end and strung, like a tennis-racquet, with deerskin. The ball is scooped up and carried on the stick and passed by tossing, but it must not be touched with the hand or foot.

LACTANTIUS FIRMIANUS (*c.* 260-*c.* 340), Christian apologist of IV. cent.; great work is the *Divinarum Institutionum libri vii.*; his pure style won him the title of *The Christian Cicero.*

LACTIC ACID. Alpha-hydroxypropionic acid. $CH_3CH(OH)COOH$. An organic acid of considerable commercial importance. First prepared by Scheele in 1780 from sour milk. It occurs widely in nature, and may be prepared by the fermentation of sugar under certain conditions. It is manufactured on a commercial scale from starch corn, glucose and other substances by fermentation with a lactic acid ferment, the acid being neutralized with calcium carbonate as

soon as formed, in order to prevent the solution becoming too acid, as the ferment will not grow in a liquor containing more than one-half per cent. acid. The liquor is then evaporated and filtered and the syrupy solution of calcium lactate, thus produced, decomposed with sulphuric acid. The acid occurs as a syrupy liquid, either yellowish brown or almost colorless, according to the degree of purity, having a specific gravity of about 1.24. It is soluble in water and alcohol, and has a sharp, acid taste. It is used in the tanning of leather for coloring and plumping, and for removing lime. In the textile industry, it is employed as a mordant, especially for woolen goods, to which it imparts lustre and softness. In medicine it is employed in the treatment of tuberculous ulcerations of the larynx, and to destroy diphtheritic membranes. A recent use to which it has been put is in the preparation of baking powder.

LACTOMETER, or **GALACTOMETER**, a contrivance for ascertaining the richness of milk. It generally consists of a graduated glass tube, the number of divisions, as a rule, being 100. This tube is filled with milk to the top of the graduated part, and the liquid is then allowed to stand so that the cream may separate. After a time it may be seen how many parts in a hundred the cream occupies.

LACTOSE. Milk sugar. $C_{12}H_{22}O_{11}$. A sugar occurring in the milk of all mammals but not found in the vegetable kingdom. Cow's milk contains from 4 per cent. to 5 per cent. lactose and human milk from 6 per cent. to 7 per cent. It is very much less sweet than cane sugar, and ferments with difficulty. It may be prepared from milk by adding rennet, separating the resulting curd, and evaporating the whey, when crystals of milk sugar will be deposited. It occurs as colorless crystals, or as a white powder. It dissolves in six parts of water at ordinary temperatures, is dextrorotatory, and reduces Fehling's solution on boiling. It is decomposed on boiling with dilute acids into glucose and galactose, and is split up by certain microorganisms with the formation of lactic acid, this being the cause of the souring of milk.

LACY, FRANZ MORITZ, COUNT (1725-1801), Austrian soldier; served in War of Austrian Succession and Seven Years War; distinguished at Breslau, 1757; associated with Daun, field-marshal, 1766; reformed army.

LADAKH AND BALTISTAN (32° 30′ to 36° N., 75° 35′ to 80° 30′ E. province, Kashmir, India. B., the northern part, lies between Karakoram and Himalayas, and is crossed by Indus and its tributaries; contains Mt. Godwin Austen and other high peaks; capital, Skardu. L., southern part, is also drained by Indus and is crossed by various ranges connecting Himalayas with Kuen-Lun; capital, Leh. Province produces fruits, cereals, gold; sheep and goats raised. Inhabitants are of Tibetan stock. Pop. 170,000.

LADD, GEORGE TRUMBULL (1842-1921), American writer and university professor; *b.* in Painesville, Ohio. He graduated from Western Reserve College, 1864, and Andover Theological Seminary, 1869. Pastor in Edinburg, Ohio, and Milwaukee, Wis.; professor of philosophy at Bowdoin, 1879-1881, and then at Yale until he retired in 1905. He was called to lecture in Japan, India, Hawaii, and France. Publications: *Doctrine of the Sacred Scriptures*, 1883; *Introduction to Philosophy*, 1889; *Philosophy of Mind*, 1891; *Psychological Description and Explanation*, 1893; *Philosophy of Knowledge*, 1897; *Essays on Higher Education*, 1899; *Knowledge, Life and Reality*, 1909; *What Shall I Believe*, 1915.

LADIES CATHOLIC BENEVOLENT ASSOCIATION, THE. Founded April 9, 1890. A fraternal sisterhood whose purpose is the moral, mental and social elevation of its members, and to furnish mutual aid and death benefits. Over $15,000,000 have been disbursed in death benefits. Members, 1922, 135,000. President, Mrs. Kate Mahoney, Troy, N. Y.

LADISLAUS I., ST. (1040-95), king of Hungary, 1077; greatly strengthened Hungarian monarchy.

LADISLAUS IV. (1262-90), king of Hungary; succ., 1272; reign marked by civil wars; defeated Rumanians, 1282, who subsequently murdered him.

LADO ENCLAVE (*c.* 5° N., 30° 15′ W.), province, Egyptian Sudan, adjoining Albert Nyanza; area, *c.* 15,000 sq. miles; formerly leased by Leopold II. of Belgium, after whose death it was restored to Anglo-Egyptian Sudan; crossed by two ranges of mts. and by Nile, Yei, and other rivers. Pop. *c.* 250,000.

LADOGA (60° 45′ N., 31° 30′ E.), lake, N. E. Russia; largest in Europe; area, nearly 7,000 sq. miles; receives surplus water of Lakes Onega, Ilmen, Saima; entered by over sixty rivers; discharges by Neva into Gulf of Finland.

LADRONES. See MARIANNES.

LADYBIRD, the popular name of the numerous species of polymorphous Coleoptera belonging to the family Coccinellidæ, and remarkable for their beautiful variety of coloring. Their chief characteristic is the curious formation of the tarsi, of which only three of the four segments are visible, the third being sunk in the second; the antennæ are short and slightly clubbed, and the head is largely concealed by the thorax. There are 2000 species, generally of a bright red or yellow color, with black or colored spots.

LADY CHAPEL, a chapel dedicated to the Virgin Mary, usually an elongation of the choir, built eastward of the high altar and projecting from the main building.

LADYSMITH (28° 18′ S., 29° 43′ E.), town, Natal, S. Africa; named after wife of Sir Harry Smith; memorable for Brit. defense, under General White, against Boers, Nov., 1899, to Feb, 1900, when relieved by Buller. Pop. 6,000

LÆLIUS, name of plebeian Roman *gens.* Caius Lælius (*c.* 235-170 B.C.) won victories over Carthaginians and Numidians. His *s.,* Caius Lælius Sapiens, consul 140 B.C., is prominent figure in Cicero's writings.

LA FARGE, CHRISTOPHER GRANT (1862), an American architect; *b.* at Newport, R. I., *s.* of John and Margaret Perry La Farge. He studied at the Massachusetts Inst. Tech. and in the office of H. H. Richardson. In 1886 he took charge of the architectural work of the firm of Hines & La Farge who were the architects of many prominent residences, churches and other buildings including the Cathedral of St. John the Divine and all stations of the New York subway. He was a member of the firm of La Farge & Morris from 1910-15 and in 1918 was asst. gen. man. of the U.S. Housing Corpn., Washington.

LA FARGE, JOHN (1835-1910), American artist; *b.* in New York, May 31, 1835; *d.* November 4, 1910. Educated here and in Paris, and married Margaret Perry a great-granddaughter of Benjamin Franklin. He painted murals for Trinity Church, Boston, 1876-1877. and took up glass painting and its manufacture in 1878. One of his finest works is the altar-piece of the Church of the Ascension, New York; others *The Muse of Painting,* Metropolitan, New York; *Coming of the Magi,* Church of the Incarnation. *Murals,* Paulist's Church, N.Y.C.. Glass. Judson Memorial Church, N.Y.C. Crane Memorial Library, Quincy, Mass. Windows: *Battle Window,* Harvard Memorial; *St. Paul at Athens,* Columbia University Chapel. Author *Considerations on Painting,* 1895; *Great Masters,* 1910; *Higher Life and Art,* 1910; *Reminiscences of the South Seas;* *See Cortissoz; John La Farge,* 1911.

LAFAYETTE, a city of Indiana, in Tippecanoe co., of which it is the county seat. It is on the Cleveland, Cincinnati, Chicago and St. Louis, the Lake Erie and Western and other railroads. It is the center of an important agricultural area and has also important industries including boot and shoe factories, car works, flour and woolen mills, marble works, etc. It is the seat of Purdue University and the State Agricultural College. There is also a high school and a public library. Pop. 1920, 22,486.

LAFAYETTE, a city of Louisiana, in Lafayette co., of which it is the county seat. It is on the Vermilion river. Its industries include cotton and cottonseed oil works, and a sugar refinery. Pop. 1920, 7,855.

LAFAYETTE COLLEGE. A Presbyterian institution at Easton, Pa. It was chartered in 1826 but the legislature failing to supply funds was not established until 1832. There are 42 college buildings valued at $1,500,000, including a memorial chapel and the Gayley Laboratory, mechanical engineering building, etc. Income about $70,000. The college confers on graduates the degrees of Bachelor of Arts, Bachelor of Philosophy, and Bachelor of Science; also of chemistry, civil engineering, electrical engineering, mechanical engineering, and mining engineering. Students, 850; teachers, 70, 1922-1923.

LAFAYETTE ESCADRILLE, THE. The idea of forming this famous flying squadron originated with Norman Prince, an American living in France, and Elliot Cowden, and William Thaw assisted in its foundation. It was composed of American aviators and some from the Foreign Legion, and was organized on April 16, 1916, at Luxeuil (Upper Saone) with George Thenault as captain. The Escadrille was transferred to the American Army January 1, 1918. The first active service of the squadron was at Verdun, where it was engaged in 146 fights and defeated 13 enemy aeroplanes. In the Vosges, and on the Somme, and at the recapture of Mort Homme and Hill 304, the Escadrille performed valuable services. In the course of the war 11 of the 42 pilots were killed.

LA FAYETTE, MARQUIS DE, MARIE JOSEPH PAUL YVES ROCH GILBERT DU MOTIER (1757-1834), Fr. revolutionary; aided Amer. Colonies in War of Independence; on return, promulgated democratic ideas; member of Assembly of Notables, 1787, and advocated summons of States-General; as commander of citizen army established National Guard and originated *tricolor*; helped to form National Assembly; co-founder of *Feuillants* club of moderates, and lost favor of court and people; retired to country; on outbreak of war, app. to command army of Ardennes, and won victories of *Philippeville*, etc.; left France as Jacobins became supreme; thrown into prison by Austrians, and remained captive till 1797, when Napoleon demanded release; upheld Liberal tradition under restored monarchy; leader of revolution, 1830.

LA FAYETTE, MARIE-MADELEINE PIOCHE DE LA VERGNE, COMTESSE DE (1633-93), Fr. novelist; revolutionized novel-writing; chief work, *Princesse de Cleves*, 1678; simple, natural style, opposed to grand eloquence of predecessors; had long liaison with La Rochefoucauld.

LAFFITTE, JACQUES (1767-1844), Fr. financier-statesman; gov. of Bank of France, 1814; trusted agent of both Napoleon and Louis XVIII.; aided Revolution and became Premier, 1830; bankrupt.

LAFITTE, JEAN (1780-1826), *b.* at Silan, Yucatan. He is first heard of as a privateer who preyed on British and Spanish shipping. He then turned to piracy and with a gang of desperadoes established headquarters on Grande Terre Island in Barataria Bay in 1812. During the war in that year Commodore Percy of the British Navy tried to secure his assistance against New Orleans. Lafitte offered his services and his men to the governor of Louisiana and to General Jackson, for a free pardon for himself and company. In the Battle of New Orleans Lafitte and his men did good service and Madison confirmed the amnesty of the former pirates.

LA FOLLETTE, ROBERT MARION (1855), United States Senator; *b.* in Primrose, Wis. Graduated from the University of Wisconsin (B.S.), 1879; admitted to the bar, 1880; member of 49th to 51st Congress, 1885-1891; delegate to Republican National Convention, 1896; delegate-at-large, 1904; governor of Wisconsin, 1901-1903, 1903-1905, and 1905-1907; U. S. Senator, 1905, for 1905-1910, resigned to run for governor; re-elected Senator, 1910-1916, 1916-1923, and 1923-1929. He led the movement for direct vote on candidates, adopted 1904.

LA FONTAINE, JEAN DE (1621-95), Fr. poet. When twenty-six, he succeeded his *f.* as Maître des Eaux et Forêts at Château-Thierry (his birthplace); the study of animal life occupied him more than survey of the royal grounds, which he nominally performed for twenty years. His friend and protector, Fouquet, inaugurated his poetic celebrity, and received dedication of his first works, *Epitres* and *Le Songe de Vaux*. When Louis XIV. dismissed Fouquet, La. F. wrote the *Elegie aux nymphes de Vaux*, incurring the king's displeasure. The *Contes*, free and licentious, in mediæval manner, but masterpieces of lightness and grace, commenced to appear, 1665; the famous *Fables*, 12 vol's, in 1668. He created a new style of fable, *viz.* a frame into which poetry as well as satire and comedy could fit, the poetry being of the simplest and least pretentious kind. He took subjects from Æsop and old Fr. *fabliaux*; language, concise and beautiful; uses old words, provincialisms, and even *patois* when it fits his meaning; reproached with want of responsibility in work and life, but successive friends provided him with homes; first Fouquet, and later in life Mme. de la Sablière for twenty years; at her death, Mme. d'Hervart took in the old poet. He, Racine, Molière, and Boileau, his attached friends, formed famous club of Rue du Vieux Colombier.

LAFONTAINE, SIR LOUIS HIPPOLYTE, Bart. (1807-64), Canadian statesman; led Fr. Canadians; twice Premier; Chief Justice, Lower Canada, 1853.

LAGASH, ruins near Shatra, Asiatic Turkey, where remains of fortress, temple, and other buildings have been excavated, and many inscriptions, statues, and miscellaneous objects found. L. was an important center of Sumerian culture in very early times.

LAGERLÖF, SELMA (*b.* 1858), a Swedish novelist and woman of letters, *b.* in Vermland, Sweden; educated at Royal Women's Superior Training College, Stockholm; taught at Landskrona, 1885-95. In 1890 she received a prize in a magazine for some chapters of *Gosta Berlings Saga*, and took up literature in earnest after 1895. She received a doctor's degree from Upsala University in 1907, and gained the Nobel prize in 1909. Her works include: *Gosta Berling*, 1891; *Invisible Links*, 1894; *Miracles of Antichrist*, 1897; *From a Swedish Homestead*, 1899; *Jerusalem*, 1901; *Legends of Christ*, 1904; *The Adventures of Nils*, 1906; *The Girl from the Marsh*, 1908.

LAGOGMAGGIORE a lake in Europe, partly in northern Italy and partly in Switzerland. It is about 40 miles long and 7 miles wide, and is crossed by the Ticino river. Its banks combine every aspect of Alpine beauty. It is surrounded by hills and contains several islands.

LA GORCE, JOHN OLIVER (1880), an American editor, *b.* at Scranton, Pa., son of Gabriel Hauteville and Elizabeth Cecilia Oliver de La Gorce. He was educated at Georgetown University. After being a special writer for various newspapers and magazines for two years, he was assistant secretary of the National Geographic Society from 1905-7 and then became connected with the National Geographic Magazine of which he was the managing editor from 1915. In addition to contributing many travel articles he was the author of: *The Warfare on Our Eastern Coast, Devil Fishing in the Gulf Stream* and others.

LAGOS (*c.* 6° 57′ N., 4° 10′ E.), province, Brit. S. Nigeria, W. Africa, bordering on Bight of Benin, between Dahomey and the eastern and central provinces of S. Nigeria, and with N. Nigeria to N.E.; area, *c.* 28,600 sq. miles; coastal regions low-lying, interior hilly; crossed by no streams of importance; climate unhealthy; mean temperature, 82° Fahr.; rainfall, *c.* 74 inches.

L. was a separate Brit. crown colony, including island and protectorate of L. from 1886 till 1906, when it was united with S. Nigeria in one colony and protectorate. Largest towns are Ibadan, Abeokuta, and Lagos. L. produces palm oil and kernels, rubber, cotton, ivory, timber, cocoa, coffee, tobacco, hides; crossed by several railway lines; administered by Provincial Commissioner. Native inhabitants are of negro stock. Pop. 1911, 2,200,000. See NIGERIA.

LAGOS (6° 28′ N., 3° 38′ E.), port, capital of S. Nigeria, W. Africa, on L. island; only good harbor within 1000 miles; mole under construction. Pop. 45,000.

LAGOS (37° 10′ N., 8° 37′ W.), port, S. Portugal; fortified; fine harbor; British defeated Fr. fleet in L. Bay, 1759. Pop. 8500.

LA GRANGE, a city of Georgia, in Troup co. It is on the Atlanta, Birmingham and Atlantic, and the Macon and Birmingham railroads. Its industries include cotton and cottonseed oil mills and a creamery. It is the seat of two women's colleges. Pop. 1920, 7,038.

LA GRANGE, a village of Illinois, in Cook co., 14 miles S.W. of Chicago, of which it is a suburban residential section. Pop. 1920, 6,525.

LAGRANGE, JOSEPH LOUIS COMTE (1736-1813), famous mathematician; *b.* at Turin, but of Fr. extraction (grandson of Descartes); prof. of Geometry at Turin Royal Artillery School at age of eighteen; app. by Frederick the Great to succeed Euler as director of Berlin Academy, 1759; went to Paris, 1787, and stayed there throughout Revolution, though in danger; loaded with honors by Napoleon; buried in Panthéon. His work on the *Nature and Propagation of Sound*, and invention of the *Calculus of Variations*, when only twenty-four, proved his wonderful abilities of analysis, and placed him at a very early age in the front rank of mathematicians. On five occasions he was awarded the prize of the Paris Academy for treatises on astronomical problems.

LA GRANJA, SAN ILDEFONSO, Span. royal residence, situated on old monastic site among hills of Segovia; palace, dating from 1721, and grounds, among finest in world.

LA GUAIRA, LA GUAYRA (10° 35′ N., 67° 2′ W.), port, Venezuela, S. America; good harbor; exports coffee, cocoa, hides. Pop. *c.* 15,000.

LA GUAYRA, or **LA GUAIRA**, chief seaport of Venezuela, on the Caribbean Sea, 10 m. N. of Caracas, of which it is the port. It is closely surrounded by mountains except to seaward. There is an excellent harbor of 90 acres, with a depth alongside the quays of 10 to 40 ft., and a large export trade is done in coffee, cacao, indigo, cotton, sugar and hides. The town is badly built, and the climate unhealthy. Pop. 12,000.

LAGUNA (1) A prov. of Luzon, Philippine Is., on Laguna Bay. The district is mountainous (chief peaks, Banajao, 6000 ft., and Maquilin, 3500 ft.), with fertile valleys, and rice, coffee, and cacao are produced. Cap. Santa Cruz. Area 752 sq. m. Pop. 150,000. (2) A town of Teneriffe formerly capital of Canary Is., situated at an altitude of 1790 ft. A bishop's see. Pop. 13,000. (3) Seaport of Santa Catharina, Brazil, on E. coast at the mouth of a lagoon running northwards parallel with the coast, 60 m. S.W. of Desterro. Pop. 3,000.

LA HARPE, JEAN FRANÇOIS DE (1739-1803), Fr. dramatist and critic; disciple and protégé of Voltaire; principal play was *Warwick*, 1763; other work poor, but excelled as contemporary literary critic; life of quarrels and hardships.

LAHN (50° 19′ N., 7° 55′ E.), river, Germany; unites with Rhine.

LA HOGUE, BATTLE OF, actions which took place off Cotentin peninsula, Normandy, May 19 to 23, 1692, ended in defeat of French by Dutch and Eng. allies at La Hogue.

LAHORE (31° 33′ N., 74° 16′ E.), town, district, and division, Punjab, India. Town is railway center; has ancient Hindu temple, Mohammedan mosques, Anglican cathedral; site of Punjab Univ.; encircled by walls; manufactures textiles, carpets; flourished under Moguls, especially under Akbar, XVI. cent.; taken by Sikhs, 1758; became capital of Brit. Punjab province, 1849. Pop. 230,000. L. district has area of 3700 sq. miles. Pop. 2,200,000. L. division has area *c.* 17,000 sq. miles. Pop. *c.* 5,600,000.

LAHR (48° 20′ N., 7° 52′ E.), town, Baden, Germany. Pop. 16,000.

LAIBACH (46° 3′ N., 14° 31′ E.), capital, Carniola, Italy; iron trade, bell foundries, textile manufactures; cathedral, episcopal see. Conference held here, 1821, to consider Ital. affairs resulted in Britain dissociating herself from Austria, Russia, and Prussia on question of right of Powers to interfere in case of revolutions. By the treaty of St. Germain, 1919, the territory of Carniola embracing Laibach was awarded to Italy. Pop. 45,000.

LAIDLAW, WALTER (1861), a clergyman, *b.* at Norval, Ont., son of Alexander Robertson and Mary Jane Patton Laidlaw. He was educated at the University of Toronto, the University of Berlin and at New York University. He was ordained a Presbyterian minister in 1886, and from then until 1892 was pastor of Jermain Memorial Church, W. Troy, N.Y., after which he was president of Fairhaven College, Washington, 1892-3, asst. Coll. Ref. Dutch Church, New York, 1893-5 was executive secretary of the Federation of Churches, New York from 1895-1921, and research and fellowship secretary, 1921-22. He was also made executive secretary of the New York City Census Com., 1919. Author: *The Moral Aims of the War.*

LAING, DAVID (1793-1878), a Scottish historian and antiquary, born in Edinburgh, the son of a bookseller; educated at Edinburgh University, and joined his father, becoming partner in 1821, and traveling in search of rare books. In 1823 he became secretary to the Bannatyne Club, and edited many of its issues; in 1826 fellow of the Society of Antiquaries in Scotland, and contributed largely to its *Transactions.*

LAIRD, MACGREGOR (1808-61), *b.* Greenock; founder of Brit. commerce with Niger; pub., with Oldfield, *Narrative of Expedition into the Interior of Africa*; founded shipping line.

LAISSEZ-FAIRE, phrase in politics meaning policy of competition without State interference.

LAI-YANG (37° 5′ N., 120° 48′ E.). walled town, Shan-tung, China. Pop, *c.* 50,000.

LAKE, portion of water surrounded by land. Fresh-Water Lakes may be formed by (1) volcanic action—*Crater l's*; (2) obstruction—landslips, glaciers, river débris, etc.; (3) sinks, where soluble rocks disappear beneath earth surface; (4) rivers which dissolve limestone in its bed; (5) glacial movement; (6) earth movement, where crust is warped. Largest l. is Superior, over 31,000 sq. miles; deepest mountain l. is Baikal, over 4000 ft. Salt-Water Lakes, (*e.g.*) Dead Sea and Great Salt Lake, owe excessive saltiness to evaporation. Caspian Sea is largest inland sea in world.

Lake Dwellings were a feature of prehistoric life and have existed in hist. times. It was the custom to drive piles into the bed of a lake near the shore, and then to build huts or dwellings on the top. The object was perhaps security from invasion or against floods. Some of the most famous are those in Switzerland, particularly the Lake of Neuchatel. Archæologists conclude that the inhabitants were by no means simple savages. Some belong to the Stone and some to the Bronze Age. L. d. existed in ancient Ireland, where they were called *crannog.* They exist at the present day in S. America, among Borneo Dyaks, and elsewhere.

LAKE, SIR PERCY HENRY NOEL (1855), Brit. lieut.-general; saw service in Afghanistan, 1878; with Sudan expedition, 1885. From 1887 to 1890 was staff captain. In Jan. 1916 he succeeded Sir John Nixon as commander-in-chief of the Mesopotamian expedition; was succeeded by General Sir Stanley Maude, Aug. 1916.

LAKE, SIMON (1866), American naval architect and inventor. Born in Pleasantville, New Jersey. Educated at Clinton Liberal Institute, Fort Plain, New Jersey, and Franklin Institute, Philadelphia. He was the inventor of submarine torpedo-boats with even keels. The first experimental one was made in 1894, and *Argonaut* in 1897. He designed submarine boats for the United States and assisted in their construction in Russia, England, and Germany. Also invented apparatus

to recover sunken ships, and for pearls and sponges, and a heavy oil internal-combustion engine for boats. President of the Lake Submarine Co., etc.

LAKE CHARLES, a city of Louisiana, in Calcasieu Parish, of which it is the parish seat. It is on the Kansas City Southern, the Louisiana Western, and other railroads, and on Lake Charles and on the Calcasieu River. It has important industries including the manufacture of lumber, ice, machine shop products, etc. It is the center of an important petroleum, lumber and sulphur producing region. It has a Federal building, public library and a sanitarium. Pop. 1920, 13,088.

LAKE CITY, a city of Florida, in Columbia co., of which it is the county seat. It is the center of an important cotton region and has industries connected with turpentine and lumber. Pop. 1920, 7,062.

LAKE DISTRICT (*c.* 54° 30′ N.; 3° 12′ W.), district round Lakes Windermere, Ulleswater, and Derwentwater, on borders of Cumberland, Westmoreland, and Lancashire; famed for beautiful lake and mountain scenery; interesting associations with Wordsworth, Coleridge, and Southey, who are called the *Lake poets*, and with Shelley, Keats, Matthew Arnold, and Ruskin; visited annually by thousands of tourists; chief towns, Ambleside, Bowness, Coniston, Keswick; among mountain peaks are Scafell, Skiddaw, Helvellyn.

LAKE DWELLINGS. See LAKE.

LAKE FOREST UNIVERSITY, an educational corporation of Illinois which operates four institutions. These are, Lake Forest College, co-educational, established in 1876, which provides courses in the liberal arts and sciences: a boys preparatory school, Lake Forest Academy founded in 1858: Ferry Hall, a girls preparatory school, 1869, and Lake Forest School of Music established in 1916. Chartered in 1857 by a group of Chicago citizens headed by Rev. W. W. Patterson, who formed the Lake Forest Association. Fifteen hundred acres were purchased on Lake Michigan and the town of Lake Forest was plotted. The endowment fund is about $1,200,000. The libraries contain over 45,000 volumes. Students 225; teachers 22, 1922.

LAKE OF THE THOUSAND ISLANDS, an extension in the upper reaches of the St. Lawrence R., Canada, near Lake Ontario, enclosing the group of rocky islets known as the 'Thousand Islands.'

LAKE OF THE WOODS, a lake that is partly in Ontario, Canada, Minnesota, and Manitoba. It is 190 miles Westnorthwest of Lake Superior and is broken by promontories; the southern part called 'Lake of the Woods,' the eastern 'White Fish Bay,' the northern, 'Clearwater Lake' and the northwestern 'Shoal Lake.' It is an irregular body of water 65 miles long and 10 to 60 wide, and navigable for vessels drawing 9 feet. Rainy River is the chief feeder. Discovered by Jaques de Noyon in 1688.

LAKEWOOD, a village of New Jersey, in Ocean co., about 60 miles S.W. of New York City. It is in the midst of a pine region and is especially suitable for invalids. It is a popular health resort. It is the seat of Georgian Court, the magnificent home of George Jay Gould. Pop. about 5,000.

LAKEWOOD, a city of Ohio, in Cuyahoga co. It is a residential suburb of Cleveland. Its public institutions include a public library and a hospital, Pop. 1920, 41,732.

LAKHIMPUR (*c.* 27° 30′ N.; 95° 30′ E.), district, Assam, India; area, *c.* 4500 sq. miles; drained by Brahmaputra and tributaries; produces tea, petroleum, coal. Pop. *c.* 375,000.

LALANDE JOSEPH JERÖME LEFRANÇAIS DE (1732-1807), Fr. astronomer; prof. of Astron. in Collège de France, 1762-1807; chief works, *Treatise on Astronomy*; *Practice of Navigation.*

LALIN (42° 38′ N., 8° 4′ W.), town, Pontevedra, N.W. Spain; paper. Pop. 16,500.

LA LINEA, LA LINEA DE LA CONCEPCION (36° 10′ N., 4° 40′ W.), town, Cadiz, Spain; formerly fortified. Pop. 1910, 35,000.

LALITPUR (24° 45′ N.; 78° 26′ E.); town, Jhansi, United Provinces, India. Pop. 11,600.

LAMA, LLAMA, see CAMEL FAMILY.

LA MADDALENA (41° 13′ N., 9° 25′ E.), island and fortress, off Sardinia. Pop. 10,000.

LAMAISM, the name given to the religious system of Tibet which is on a joint political and ecclesiastical basis and is a modified form of Buddhism (*q.v.*). In the II. cent. A.D., about 700 years after the life and teachings of Gotama, there arose the doctrine of the *Great Vehicle*, which, while it professed to continue, largely modified the ideas of the founder (it was so-called in distinction to the *Little Vehicle*, that of Gotama). Belief arose in a number of

powerful angelic beings. Thus, there was a drift away from the simplicity of early Buddhism. Primitive superstitions revived and the Tantra system arose, a form of religion so degraded that scholars have turned with disgust from its lit. This debased Buddhism was introduced into Tibet by Srong Tsan Gampo in 622 A.D., but his successors persecuted its adherents, and it was not firmly planted till the next cent. It declined again and was reintroduced in 971.

In the XIII. cent. the Mogul Emperor, Kublai Khan, granted to the abbots of the Sahya monastery the temporal sovereignty of the country, and this combined spiritual and temporal power —temporal over Tibet, spiritual (as the head of the Buddhist Church) throughout China—still endures. A reformation took place under Tsonghapa about 1400. On the death of the Grand Lama another is elected from recently born children.

LAMAR, LUCIUS QUINTUS CINCINNATUS (1826-93), American jurist. *b.* in Eatontown, Ga. *d.* at Macon, Ga. Educated at Emory College, Georgia, bar 1847, professor of mathematics University of Mississippi 1850-52. Member Georgia Legislature 1853: Congress from Mississippi 1857-59; resigned 1860. He drafted the Mississippi ordinance of secession passed in 1861. Lieut. Colonel 1st Mississippi Confederate regiment, and fought at Yorktown and Williamsburg. Resigned from army in 1862. In Europe 1863-64. Judge-Advocate 3rd army corps to the end of the war. Held chairs of ethics, metaphysics, and law. U. of Mississippi 1866-70. Resigned when the state was re-admitted to the Union. Congress 1873-77. U.S. Senator, 1877-85. Secretary of Interior 1885-88, then associate justice of U.S. Supreme Court.

LAMAR, MIRABEAU BONAPARTE (1798-1859), former President of Texas; *b.* Louisville, Ga., *d.* Richmond, Texas; uncle of U.S. Supreme Court Justice Lucius Q.C. Lamar, 1825-93. As a young man he was occupied in farming and commercial pursuits and became the founder, 1828, of an organ of State rights, the Columbus *Independente*. Settling in Texas in 1835, he joined the revolutionary movement then at its crest there against Mexico and took part with American Texans in proclaiming a provisional republic to overthrow the military dictatorship established by Santa Anna. He fought at the battle of San Jacinto, where a Texan army under Sam Houston defeated and captured Santa Anna. The next year, as major-general, he held chief command of the new republic's army and was also Vice-President, after serving as Attorney General and Secretary of War of Texas. In 1838 he became President of Texas succeeding Sam Houston, his tenure of office lasting until 1841, in the course of which the leading European powers recognized the independence of Texas. He joined the U.S. army in the Mexican War of 1846, serving under General Taylor at the battle of Monterey, and later fought frontier battles with the Comanche Indians for two years at the head of an armed force stationed at Laredo. From 1857 to within a short period before his death he was U.S. Minister to Nicauragua and Costa Rica.

LAMARCK, JEAN DE (1774-1829), eminent Fr. zoologist; *b.* Picardy; ed. Amiens; served in the army but always had a love for nature; occupied important scientific posts in Paris, where he died. He is best known as the founder of Lamarckism, which attempts to explain the mechanism of evolution by assuming that characters acquired by an individual are transmitted to its offspring. See EVOLUTION, HEREDITY.

LAMARTINE, ALPHONSE MARIE LOUIS DE PRAT DE (1790-1869), Fr. poet; one of pioneers of Romantic school; had deep religious feeling, with some of monotony of verse of preceding age; wrote with ever-increasing facility; traveled a great deal, and mixed in politics, especially in 1848, when he showed great gifts of eloquence and was a member of Executive Committee; scanty means compelled him to subsist on proceeds of pen; romantic feelings depicted in the *Meditations*, 1820, *Les Nouvelles Meditations*, 1823, among which is his masterpiece; *Le Lac*. *Jocelyn* appeared 1836, journal of a heroic soul; attempted new line, 1835, with *Voyage en Orient* in prose; best prose work, rhetorical *Historie des Girondins*, 1847.

LAMB, CHARLES (1775-1834), Eng. essayist; *b.* London; ed. Christ's Hospital, where formed friendship with fellow-scholar, Coleridge; held clerkships in South Sea House and India House; never *m.*, but devoted life to mad sister Mary; himself under restraint, 1795-96; dabbled in verse and journalism; with Mary wrote *Tales from Shakespeare*, 1807; fascinated by Elizabethan and XVII.-cent. poets; pub. *Specimens of English Dramatic Poets*, 1808; contributed essays on wide variety of subjects, under name *Elia*, to *London Magazine*, 1820-22.

LAMB, MARY ANNE (1764-1847), an author, was the sister of Charles L.,

the essayist, whose senior she was by eleven years. Mentally unbalanced, she first gave signs of her desperate condition when in 1796, in a fit of fury, she mortally wounded her mother by stabbing her with a knife. She was tried, and a verdict of temporary insanity was brought in; but instead of being consigned to an asylum, she was so fortunate as to be handed over to the custody of her brother, who took charge of her so long as he lived. In 1807 she assisted him in the preparation of the *Tales from Shakespeare*, and while he wrote about the tragedies, she dealt with the comedies. In 1833 she married Edward Moxon, the publisher. Mary L. survived her brother about thirteen years.

LAMBALLE, MARIE THERESE LOUISE, PRINCESS DE (1749-92), a *dau.* of the Prince of Carignan, *b.* at Turin. In 1767, she married Stanislaus, Prince of Lamballe, who died the next year. She was the devoted companion of Marie Antoinette, and was appointed by her superintendent of the royal household. Refusing a means of escape, she was imprisoned with her mistress in the Temple for a week, then removed to La Force, and beheaded, and her head, on a pike, was placed in front of the queen's apartments.

LAMBAYEQUE (6° 48′ S., 79° 52′ W.), maritime department (and town), Peru, S. America; area, 4614 sq. miles. Pop. *c.* 124,000.

LAMBERT, ALEXANDER (1861), an American physician; *b.* at New York, *s.* of Edward Wilberforce and Martha M. Waldron Lambert. He was educated at Yale University and at the College of Physicians and Surgeons (Columbia). He was assistant bacteriologist of the New York Health Department from 1894-1901, was professor of the clinic of medicine at Cornell University from 1889 and attending physician at Bellevue Hospital from 1894. He was also Col. R.C., U.S.A., and medical head of the American Red Cross in France, 1917.

LAMBERT, FRANCIS (*c.* 1486-1530), Fr. Reformer; became Franciscan, 1501; converted to Protestantism, 1522; present at Marburg Conference, 1549; supported by Philip of Hesse.

LAMBERT, JOHANN HEINRICH (1728-77), Ger. physicist, philosopher, and mathematician; first to make photometric measurements of intensity of light.

LAMBERT, JOHN (1619-83), Eng. general; Roundhead in Civil War; distinguished at siege of Hull, 1643, *Dunbar*, *Worcester*, and other battles and sieges; member of Committee of Safety, 1659; crushed Royalist rising under Booth; 1659; major-gen. of forces in England and Scotland, 1659; sent against Monk, whose march he was unable to oppose, owing to dwindling of army; arrested at Restoration; banished to Guernsey.

LAMBESSA, LAMBÈSE (35° 28′ N., 6° 13′ E.), village, Algeria, Africa; interesting Rom. remains include so-called prætorium, baths, temples, aqueducts, and great number of inscriptions.

LAMBETH (51° 28′ N., 0° 3′ W.), metropolitan borough, S. London; contains L. Palace, seat of abp's of Canterbury, which has fine library and portraits of abp's. Pop. 1921, 302,960.

LAMBETH CONFERENCES, attended by all Anglican bp's, meet at Lambeth Palace to bring about closer union and discussion of common interests between Eng. and colonial churches. The first Conference was held in 1867, second, 1878, third, 1888, fourth, 1897, fifth, 1908. Unlike Convocation they possess no formal authority, but have considerable influence; various questions, doctrinal, disciplinary, social, and educational, are discussed.

LAMECH, patriarch in *Genesis*; legendary *f.* of Noah; name may be derived from Babylonian myth.; possibly connected with an Arabic word for a young man.

LAMELLIBRANCHIATA or **BIVALVES, PELECYPODA, ACEPHALA, LIPOCEPHALA;** a large class of Molluscа, containing more than 5000 species scattered throughout the waters of the world. Its members are in almost all cases readily distinguished from other molluscs by the obvious presence of a shell composed of two strong limy valves within which the animal is sheltered. The Bivalve body, moreover, is less body-like than that of the Univalves or Gasteropods, for there is no head wth tentacles, and the structures lie in bisymmetrical layers, the body proper and the foot being enclosed on both sides by the gills, and these again by the mantle folds, which are attached to the valves of the shell.

LAMENNAIS, HUGUES FELICITÉ ROBERT DE (1782-1854), Fr. ecclesiastical and political controversialist; ordained he became prof. of Math's, 1811; strong defender of Catholicism, and condemned 'Gallican' liberties (partial independence of Fr. Church from papal control); became increasingly democratic, denouncing all connection of

Church with state and with monarchy. Although he believed himself a devoted Catholic, his views met with papal disapproval, and he left the Church, devoting himself entirely to political propaganda; imprisoned for a year in 1840 for his book *Le Pays et le Gouvernement*; wrote numerous works, and his correspondence (some of it important) is published.

LAMENTATIONS, BOOK OF, in Hebrew canon, together with the *Song of Songs*, *Ruth*, *Ecclesiastes*, and *Esther*, forms *Megilloth* (Rolls). L. is made up of five separate poems, dealing with the woes that have befallen the Hebrew nation by the taking of Jerusalem in 586. The poems are beautiful, but are conscious art rather than spontaneous outpourings. The author is not named, but early tradition to be found in the LXX makes him Jeremiah. The balance of probability is thought by competent scholars to be against Jeremiah's authorship, but quite possibly it is by one of his disciples, and dates from a period not long after him; it is possibly not all by one writer.

LAMONT, DANIEL SCOTT (1851-1905), Secretary of War (1892-96); *b.* Cortlandville, N. Y.; *d.* Millbrook, N. Y. He became a journalist at Albany after studying at Union College and acquired some note as a political writer. In 1883, Grover Cleveland, then Governor of New York, made him his private secretary, a post he continued to occupy during Cleveland's first term as President. With Cleveland's return to the Presidency four years later he was chosen Secretary of War, and on retiring from that office became President of the Northern Pacific Railroad.

LAMONT, THOMAS WILLIAM (1870), banker; *b.* Claverack, N. Y. He graduated from Phillips Academy, Exeter, N. H., and from Harvard, and entered journalism, serving on the New York Tribune from 1893 to 1894. In 1903 he became secretary and treasurer of the Bankers Trust Company, and two years later vice president, holding that office till 1909, when he joined the First National Bank of New York City in a similar capacity. As a partner in the banking firm of J. P. Morgan & Company since 1911 he became a member of the directorates of a number of large financial and commercial corporations.

LA MOTTE, ANTOINE HOUDAR DE (1672-1731), a French poet and dramatist, born in Paris. His first comedy, *Les Originaux*, 1693, was a failure, and he contemplated entering a monastery, but the success of his ballet, *L'Europe Galante*, 1697, led to a series of successful operas and tragedies, of which the most famous is *Ines de Castro* 1723. Other works are a verse translation of the *Iliad*, 1714, founded on Madame Dacier's translation, 1699; *Reflexions sur la Critique*, 1715; *Fables*, 1719; *Odes*, 1707.

LA MOTTE, FOUQUE. See FOUQUE.

LAMP, a device for producing artificial light by inflammable liquid, oil, gas, or electricity. No doubt the first lamps were animals' skulls and later baked earth and metal—bronze being generally used. In 1784 Argand at Geneva invented a lamp with circular wick and glass chimney, which was considerably improved by Franchot in 1837. Nowadays oil lamps consist of a reservoir, for the oil, below the wick (either flat or circular, single or multiple), which is sucked up the wick by capillary action. Safety lamps (*q.v.*) are used by miners and acetylene lamps (*q.v.*) by motorists. See also LIGHTING.

LAMPEDUSA (35° 30′ N., 12° 30′ E.), island, between Malta and Tunis, Mediterranean Sea; belongs to Italy; has Rom. and Carthaginian remains. Pop. *c.* 2000.

LAMPERTHEIM (49° 36′ N., 8° 28′ E.), town, Darmstadt, Germany. Pop. 12,000.

LAMPMAN, ARCHIBALD (1861-1899), Canadian poet; *b.* Morpeth, Ontario; *d.* Ottawa. He was a graduate of Trinity College, Toronto, and in 1883 entered the government service as a post-office official, remaining a civil servant till his death. Much of his poetry was the product of his vacations, which were spent in the country bordering the Great Lakes or in exploring the Laurentian wilderness. He wrote sparingly and sustained a high level in every line he put to paper. He is viewed as one of the greatest of Canadian poets and as standing alone as a poet of the open fields and the wild places. He was descended from a German-American colonial family of Loyalists who emigrated from Pennsylvania to Canada when the Revolution came.

LAMPOON, a virulent satire in prose or verse, usually a personal attack. The name comes from the old burden sung to these libels, 'Lampone, lampone, camerada lampone.'

LAMPREYS (*Petromyzontidae*), eel-like primitive fishes with round, sucking mouth, and seven gill-slits. They are carnivorous and feed on fishes, worms, and insects; living in the sea and spawning in rivers; some are esteemed as food.

LAMPSACUS (40° 19′ N., 26° 39′ E.), ancient Hellenic town, Asia Minor.

LANAI. See HAWAIIAN ISLANDS.

LANARKSHIRE (55° 45′ N., 3° 55′ W.), county, S.W. Scotland; area, 879 sq. miles; surface rises from N. to Lowther Hills in S.; watered by Clyde and its tributaries. In S. are sheep farms, in center market gardens and orchards, in N. important coal-fields. L. is most populous and busiest manufacturing county in Scotland; contains Glasgow, Hamilton, Airdrie, and other industrial centers. Manufactures iron goods, steel, machinery, textiles. Pop. 1921, 1,539,367.

LANCASHIRE (53° 45′ N., 2° 35′ W.), N.W. county palatine, England; area, *c.* 1890 sq. miles; low, flat coast is much indented, so that there are many good harbors; surface rugged and mountainous in N. and E., reaching an extreme height of 2633 ft. in Coniston Old Man in N.; drained by Duddon, Lune, Ribble, Mersey, Irwell, and other rivers. During last two cent's chief events have been the growth of cotton trade, with which the inventions of Hargreaves, Arkwright, and others are associated; opening of first English railway in 1830, and the cutting of various canals, of which the Bridgewater was the first. L. is most populous and busiest manufacturing county in England; contains large coalfield, which has become seat of greatest cotton industry in world, with center at Manchester, while Bolton, Preston, Oldham, Blackburn, Burnley, Rochdale, Bury, Ashton, and Middleton are also engaged in this trade. Copper, slate, earthenware clay, fireclay, are also found, and in the N. are large deposits of iron ore which have developed great iron and steel industries, as at Barrow-in-Furness. Liverpool is an important center of shipping trade, accounting for one-fourth of imports and two-fifths of exports of United Kingdom. Manufacture of machinery is also important; other industries include shipbuilding, dye-works, manufacture of glass, soap, leather, silk and woolen textiles. County is crossed by numerous railways, and by several canals, including the Manchester Ship Canal between Liverpool and Manchester. Pop. 1921, 4,928,359.

LANCASTER, a city of Ohio, in Fairfield co., of which it is the county seat. It is on the Hocking Valley, Pennsylvania Company, and other railroads, and on the Hocking river and canal. It is surrounded by an extensive farming community of which it is the trade center. Its industries, which are important, include the manufacture of agricultural implements, foundry products, shoes, wood pulp machinery, and glass. It is the seat of the State Industrial School for Boys. Its public buildings include a court-house and high school. Pop. 1920, 14,706.

LANCASTER, a city of Pennsylvania, in Lancaster co., of which it is the county seat. It is on the Philadelphia and Reading and other railroads. It is the most important manufacturing center in the county and is an important tobacco market. Its other industries include cigar making, cattle raising and the manufacture of cotton goods, iron and steel goods, shoes, etc. Lancaster is the seat of Franklin and Marshall College. Among its public buildings are the Lancaster, St. Joseph and county hospitals, children's home, Y.M. C.A. building, and two libraries. The city was settled in 1729 and from 1799 to 1812 was the State capital. It received a city charter in 1818. Congress sat here for a few days in 1777. Pop. 1920, 53,150.

LANCASTER —(1) (54° 3′ N., 2° 48′ W.), town, Lancashire, England; castle, now used as county prison, was built on site of Rom. castle in Norman times, and restored by John of Gaunt; fine old church, dedicated to St. Mary; connected with Kendal and Preston by L. canal; cabinetmaking, upholstery, cottons. Pop. 1921, 40,212.

LANCASTER, HOUSE OF, family descended from Edmund, *s.* of Henry III., Earl of L. in 1267, whose *s.* Thomas led nobles in Edward II.'s reign and was executed for treason. His nephew Henry became duke, and was succ. by *dau.*, Blanche; she *m.* John of Gaunt, *s.* of Edward III., who became Duke of L. and immediate ancestor of Lancastrian kings; he was suspected of aiming at succession to throne, and sent on missions to France. His *s.* Henry deposed Richard II., becoming first Lancastrian king. House fell in Wars of Roses.

LANCASTER, SIR JAMES (*d.* 1618), Eng. navigator; commanded E. India Company's expedition to E. Indies; encouraged Hudson and Baffin in polar exploration; Lancaster Sound named after him by Baffin.

LANCASTER, JOHN OF GAUNT, DUKE OF (1340-99), *s.* of Edward III.; *b.* Ghent; served in Spain, 1367, France, 1369; after second marriage, with Blanche of Castile, assumed title, king of Castile; towards close of Edward III.'s reign, attained great power in England; supported Wycliffe; after

Richard's accession, supported king; unsuccessfully invaded Castile, 1387; Duke of Aquitaine, 1390; governed Aquitaine, 1395.

LANCASTER SOUND, an outlet of Baffin Bay, connected with Boothia Gulf on the south by means of Prince Regent Inlet. It was discovered by the Baffins in 1616 and navigated by Parry in 1819.

LANCASTER, THOMAS, EARL OF (1277-1322), grandson of Henry III.; led barons against Edward II.; defeated and captured at Borough bridge; executed for treason.

LANCE, the long spear used by a certain class of cavalry called lancers. The pennon at the spearpoint frightened the horses of opponents. When not in use the lance is attached by a sling to the soldier's elbow. In Germany the lance is made of hollow steel.

LANCELOT, hero of Arthurian legend. The story is best known through Malory's beautiful version and Tennyson's poetical rendering. The most famous incidents in his life are his appearance at Arthur's court, his infatuation for Arthur's wife, Guinevere, his rescue of the queen, his unsuccessful Grail quest, which terminated only in a fleeting vision of the sacred vessel, his subsequent unconsciousness, lasting for as many days as he had spent years in sin.

LANCET, term applied to a two-edged, lance-pointed surgical instrument, for opening abscesses, etc.; in architecture, one form of the pointed arch.

LANCEWOOD, a popular name of several varieties of trees which grow in Jamaica, Cuba and Guiana. The wood is tough and elastic and is much employed for the construction of carriages and other uses where light and elastic timber is required.

LAN-CHOW-FU (36° 5′ N.; 103° 55′ E.), town, Kan-su, China. Pop. variously estimated at from 80,000 to 500,000.

LANCIANI, RUDOLFO AMEDEO, an Italian archæologist; *b.* Jan. 1, 1847. He was celebrated for his investigations into the ruins of classical Rome. Amongst his numerous works are *Ancient Rome in the Light of Recent Discoveries,* 1888; *Pagan and Christian Rome,* 1892; *Ruins and Excavations of Ancient Rome,* 1898; and the *Wanderings of the Roman Campagna,* 1909.

LANCIANO (42° 14′ N.; 14° 25′ E.), cathedral town, Italy; seat of bishopric. Pop. 18,500.

LAND occupies about two-sevenths of the earth's surface, with an estimated area of 55,100,000 sq. m. During the Neolithic Age (See ARCHÆOLOGY) men began to employ agriculture as a means of supplying themselves with food, and thus land acquired value. The tide of Aryan invasion from the East, and, later, the restless movements of Teutonic and Slavonic peoples, did much to change ownership of land in Europe, but by the Middle Ages it was comparatively settled.

With increase of civilization came regulations regarding land tenure to replace those of Rome, which had been swept away by barbarism; the most important was Feudalism, which flourished in France till the Revolution of 1789, and in England till the agrarian revolutions of the 15th and 16th centuries, which turned great tracts of country into pasturage and created the large farmer. The 18th and 19th centuries saw a reversion to agriculture and at present the small farmer is being encouraged as much as possible in order to repeople the land. Of late years the question of state ownership has been raised, especially by Socialists.

LAND-CRAB, the popular name given to the species of Gecarcinidæ, a family of malacostræan crustaceans which only occasionally visit the sea or fresh waters. They have a square, convex carapace and moderately large eyes. The species of *Uca* are found in the mangrove swamps of S. America, and those of *Gecarcinus* inhabit the forests of the West Indies.

LAND GRANTS, or **PATENTS,** by which the United States Government has gradually transferred the public domains to private ownership. Originally the land was claimed by the various colonies, or states, but after the establishment of the Federal Government all these claims were yielded in favor by the individual states, by New York, in 1781, Virginia in 1784, Connecticut, in 1785; Massachusetts, in 1786, the southern states following. For many years, until 1862, it was the policy of the Federal Government to make grants to individuals for services rendered to the Republic. In this way 10,000,000 acres had been granted in return for military services rendered during the Revolution, the Indian wars or the War of 1812, up to 1840, and over 60,000,000 acres were granted to veterans of the Mexican War. This policy was unsatisfactory, as few of the veterans made use of the land, but sold it speculatively. In 1862 the Homestead Act was passed, whereby limited grants were made to actual settlers, requiring five years

residence before title would be granted. Large grants have also been made to corporations to encourage railroad building. Public lands, usually opened Indian reservations, are also sold at public auction. In 1921 over 15,500,000 acres of public land were disposed of by both methods.

LAND LEAGUE, THE, formed by Michael Davitt, and other Irish politicians in 1879, as an organization for promoting reforms of land tenure in Ireland. The agitation of its members resulted in Irish tenants forming a kind of trade union, by the rules of which they were bound to refuse dealings with any tenant who had taken land from which its former occupier had been evicted. One of the first victims was Captain Boycott, whose name has ever since been a synonym in the English language for *shunning* a person. According to modern historians of Irish affairs, the L. L. did its utmost to warn the peasantry against deeds of actual violence. The L. L. was a great factor in the history of agrarian reform in Ireland, and one of the first legislative fruits resulting from it was the concessions in Gladstone's Land Bill, 1881. The L. L. through Parnell then advised Irish tenants generally to abstain from litigation against landlords until certain test cases had been decided. The result was that the government interpreted Parnell's advice as an attempt to thwart its legislation, and promptly imprisoned him under the Coercion Act. Later, when other prominent members of the L. L. were imprisoned, the league was dissolved.

LANDAU.—(1) (49° 11′ N., 8° 6′ E.), town, Bavaria, Germany; formerly fortified; site of Augustinian monastery. Pop. 1910, 20,000. (2) (48° 41′ N., 12° 43′ E.), town, Lower Bavaria. Pop. 3200.

LANDER, RICHARD LEMON (1804-34), an English explorer; *b.* at Truro, Cornwall. In 1825 he accompanied Hugh Clapperton on his second expedition to W. Africa, and was with his leader at his death at Sokoto (1829), publishing Clapperton's journal in 1829, with additions of his own as *Journal of Richard Lander from Kano to the Coast*, followed by *Records of Captain Clapperton's Last Expedition to Africa*, 1830. In 1830 L. was sent, with his brother John (1807-39), by the British government to explore the lower course of the Niger, an account of which they published in 1832 as *Journal of an Expedition to Explore the Niger*. During a second expedition to the Niger in 1834 L. was killed by natives.

LANDES.—(1) (44° N., 0° 50′ W.), S.W. department, France; area, 3604 sq. miles; watered by Adour; large forests; produces resin, charcoal, rock-salt, iron; horses bred. Pop. 300,000. (2) (44° 30′ N., 0° 55′ W.), district, S.W. France, occupying parts of dept's of L., Gironde, and Lot-et-Garonne. Mainly covered by pine forests and fields.

LANDESHUT (50° 46′ N., 16° 3′ E.), town, Pruss. Silesia, Germany. Pop. 15,000.

LANDGRAVE, or COUNT (Ger. *Land*, country, and *Graf*, count), a German title of nobility corresponding to a duke in England and a count in France. It was originally adopted by some counts, several of them of royal rank, in the 12th century to distinguish themselves from inferior counts under their jurisdiction. At the break-up of the Holy Roman empire the Ls. assumed independent sovereignty. The title is now rare, most of the landgraviates having been incorporated in the Prussian empire.

LANDIS, KENESAW MOUNTAIN (1866), an American jurist; *b.* in Millville, Ohio. He graduated from the Union College of Law, in Chicago, in 1891, and then practiced law in Chicago until 1905, except during two years, when he was private secretary to Secretary of State Gresham. He was U.S. judge for the Northern District of Illinois from 1905 until 1922, when he resigned to devote his whole time to his duties as commissioner for the American and National Leagues of Professional Baseball Clubs and the National Association of Professional Baseball Leagues, a position he had held since 1920. He was also arbiter of the building trades wage dispute and as such fixed the wages in all classes of building trades, in Chicago, in 1921.

LANDON, MELVILLE DE LANCEY (ELI PERKINS), (1839), an American writer and humorist; *b.* in Eaton, N.Y. He graduated from Union College, in 1861, served in the Federal Army during the Civil War, emerging from that experience with the rank of major. For a while he was a cotton planter in the South, then spent some years traveling abroad, being for a while secretary of the American legation in Russia. He became widely popular as a writer of humorous articles. Among his books, which include serious works, are: *A History of the Franco-Prussian War*, 1871; *Wit, Humor and Pathos*, 1875; *Wit and Humor of the Age*, 1880; *Thirty Years of Wit*, 1890; and *Eli Perkins on Money—Gold, Silver or Bimetallism*, 1895.

LANDOR, WALTER SAVAGE (1775-1864), Eng. prose-writer and poet; *b.* Warwick; ed. Rugby (removed at re-

quest of headmaster) and Trinity Coll., Cambridge (rusticated); headed volunteer force, raised at his expense, in Peninsular, 1808; traveled in Europe for several years; finally settled at Florence; friend of Southey and Browning. His works are distinguished by purity of style and delicacy of diction; sometimes striving after beauty leads to obscurity; wrote fluently in Eng., Lat. and Ital. Best-known works are *Poems*, 1795; *Gebir* (revised ed. 1803) *Count Julian*, 1812; *Imaginary Conversations*, 1824-26; *Pericles and Aspasia*, 1836; *Poemata et Inscriptiones*, 1847; *Hellenics*, 1847.

LAND'S END (50° 4′ N., 5° 43 E.), headland, Cornwall; most westerly point of England.

LANDSBERG -AN -DER -WARTHE (52° 46′ N., 15° 13′ E.), town, Pruss. Brandenburg, Germany. Pop. 40,000.

LANDSEER, SIR EDWIN HENRY (1802-73), Eng. painter; *b.* London; *s.* of an engraver; early began to sketch animals from life, and exhibited at the Royal Academy when 13. In 1818 he attracted attention by his *Fighting Dogs getting Wind*. Dogs and deer were his favorite subjects; and the Scot. Highlands furnished the scenes of some of his best pictures, all of which are familiar from engravings. The bronze lions of the Nelson Monument, London, were of his modeling. He is buried in St. Paul's Cathedral.

LANDSHUT (48° 32′ N., 12° 9′ E.), town, Bavaria, Germany; interesting old churches. Austrians defeated by Napoleon, 1809. Pop. 30,000.

LANDSKNECHTE, Ger. mercenary foot-soldiers, first raised by Maximilian I.; prominent in Ital. wars.

LANDSKRONA (55° 52′ N., 12° 49′ E.), port, Sweden; industrial center. Pop. 18,000.

LANDSLIP, fall of rocks or earth due to undermining action of sea, or removal of underlying strata by heavy rains or melting snow; common in Alps and tropical countries where rainfall is excessive during wet seasons.

LAND TAX. See SINGLE TAX.

LANE, ALFRED CHURCH (1863), an American geologist; *b.* at Boston, *s.* of Jonathan A. and Sara D. Clarke Lane. He was educated at Harvard and at the University of Heidelberg. After being petrographer of the Michigan Geological Survey and an instructor at the Michigan College of Mines for three years, he was assistant state geologist of Michigan from 1892-9 and state geologist from 1899-1909, after which he was Pearson professor of geology and mineralogy at Tufts College, Mass. He was also with the Y.M.C.A. and head of the dept. of mining, A.E.F. Univ., Beaune, France, 1919. Author *Die Korngrosse der Auvergnosen.*

LANE, EDWARD WILLIAM (1801-76), Brit. Arabic scholar; went to Egypt on account of his health; pub. *Manners and Customs of the Modern Egyptians*, a translation of the *Arabian Nights*, and the famous *Arabic Lexicon*, a standard work.

LANE, FRANKLIN KNIGHT (1864-1921), Secretary of the Interior (1913-20); *b.* Prince Edward Island, Canada. He was educated in California, where he settled in his early youth, and graduated at the State University there in 1896. Three years later he was admitted to the bar after meantime engaging in newspaper work, and practiced in San Francisco, of which he was city counsel from 1897 to 1902. Entering politics, as a Democrat, he was defeated as a candidate for governor of California in 1902, and the next year failed of election as candidate for U.S. Senator. He became of national note as a member of the Interstate Commerce Commission (*q.v.*), to which body President Roosevelt, disregarding politics, appointed him in 1905, and of which he became chairman in 1913. Upon President Wilson taking office in the latter year he entered his Cabinet as Secretary of the Interior, and during his tenure took an active part in providing Alaska with a government-built railroad by securing legislation authorizing its construction. He became vice-president of the Pan-American Petroleum and Transport Company of New York after the close of the Wilson administration. A mountain peak at Mount Ranier National Park was named after him—as a tribute to his memory.

LANE, RALPH NORMAN ANGELL (1874), an English writer; *b.* in England, and educated in France and Germany. He came to the United States in 1890 and engaged in ranching and newspaper work in the West, but went back to Europe in 1898, as correspondent for several American newspapers. Later he was editor of the Paris edition of the London Daily Mail. His fame rests, mainly on his book *The Great Illusion*, 1910; but he has also written *Patriotism Under Three Flags*, 1903; *The World's Highway*, 1915; and *The Dangers of Half-Preparedness*, 1916.

LANFRANC (*d.* 1089), abp. of Canterbury; *b.* at Pavia; became jurist; monk at Bec, 1142, subsequently prior;

pened school in monastery; defended loctrine of transubstantiation against Berengar of Tours. Obtained favor of William the Conqueror; became abbot, of St. Stephen's, Caen, 1066; abp. of Canterbury, 1067; reformed ecclesiastic organization; separated ecclesiastical from other courts; discovered and defeated conspiracy of 1075.

LANFREY, PIERRE (1828-77), a French historian, was expelled from the College of Chambéry because he attacked the Jesuits, his school-masters, and later studied law at Grenoble and Turin. His *L'Eglise et les Philosophes au XVIIIe Siecle*, 1855; and his *Essai sur la Revolution francaise*, 1857, at once gave him a position among contemporary men of letters. But his *magnum opus* was his *Histoire de Napoleon I.*, 1867-75.

LANG, ANDREW (1844-1912), Scot. scholar; *b.* Selkirk; was a dainty poet, admiring and practicing Old Fr. forms; wrote a full *History of Scotland*; with Butcher trans. the *Odyssey*, with Leaf and Myers the *Iliad*; authority on folklore and fairy stories. One of the most accomplished and versatile men of letters of his day.

LANG, COSMO GORDON (1864), Archbishop of York from 1908; educated at Glasgow and Oxford; curate of Leeds (1890-93); fellow and dean of divinity, Magdalen Coll., Oxford (1893-6); vicar of St. Mary's, Oxford (1894-6); vicar of Portsea (1896-1901); bishop suffragan of Stepney and canon of St. Paul's (1901-8); hon. chaplain to Queen Victoria; visited U.S. in 1918. His writings include *The Miracles of Jesus, as Marks of the Way of Life*, 1900; *The Parables of Jesus*, 1906; *The Opportunity of the Church of England*, 1906.

LANG, GEORGE (1879), college president; *b.* at Wellwood, Scotland; *s.* of George McCraken and Mary James Lang. He was educated at Southwestern Presbyterian University, Clarksville, Tenn., and later took postgraduate course in philosophy at the University of Edinburgh and in German language at the University of Berlin. He was professor of philosophy at Alabama Presbyterian College from 1910-15 and the following year was professor of ecclesiastical history at Southwestern Presbyn. University. In 1916 he became president of Alabama Presbyterian College but resigned in 1919 to become professor of philosophy at the University of Alabama.

LANG, KARL HEINRICH, RITTER VON (1764-1835), Ger. historian; archivist in Munich, 1810-17; wrote *Memoiren*.

LANGDON, JOHN (1741-1819), Amer. politician; senator, 1789-1801; gov. of New Hampshire, 1805-9, 1810-12.

LANGDON, STEPHEN HERBERT (1876), American Assyriologist, *b.* in Monroe, Mich. He graduated from the University of Michigan, in 1898 and then continued his studies in France, Germany and England. Since 1908 he has been professor of Assyriology at Oxford University, in England. He is the author of many authoritative works on Assyriology, among these being *Babylonian Liturgies*, 1912; *Tammuz and Isthar*, 1914 and *Sumerian Liturgies and Psalms*, 1919.

LANGE, CHRISTIAN L. (1869), a Norwegian university professor and noted pacifist. For many years he was secretary of the Nobel committee in the Norwegian Storthing and professor of history at the Norwegian Nobel Institute. In 1920 he became general secretary of the Interparliamentary Union. In 1921 he was the representative of Norway at the League of Nations Assembly, where he severely criticized the League Council for its disregard of the question of disarmament. In that same year he and Hjalmer Branting, the Swedish Socialist, were awarded the Nobel Peace Prize. He has written numerous articles and books most of them on the question of disarmament and peace.

LANGENSALZA (51° 7′ N., 10° 40′ E.), town, Pruss. Saxony, Germany; ruined monastery. Prussians defeated Hanoverians, 1866. Pop. 15,000.

LANGFITT, WILLIAM CAMPBELL (1860), a U.S. army officer, born at Wellsburg, Va., son of Obadiah and Virginia Tarr Langfitt. He graduated from the United States Military Academy in 1883 and from the Engr. Sch. of Application, Willets Point, N.Y., 1886. After serving on various assignments as engineer officer of river and harbor improvements he organized the 13th Engineers and joined the A.E.F. in France in 1917 and the following year was made chief engineer of the A.E.F., in charge of military engineering and engineer supplies, construction and forestry, light railways and roads with the rank of major-general. He resigned in 1920 at his own request.

LANGHAM, SIMON (*d.* 1376), abp. of Canterbury, 1366-68; cardinal, 1368.

LANGHORNE, JOHN (1735-79), a poet, *b.* at Kirkby Stephen, Westmorland. He was educated at Appleby and Cambridge, and after filling several curacies became rector of Blagdon,

Somersetshire, in 1766. He wrote for the *Monthly Review*, and published several volumes of popular poetry. His most important work is the translation of Plutarch's *Lives*, written in conjunction with his brother. He died at Blaydon.

LANGLAND, WILLIAM, LANGLEY (*c.* 1332-1400), reputed author of *Piers the Plowman*; antiquaries have pieced together the following biographical facts: *b.* in Shropshire *c.* 1332; received monastic education; destined for priesthood, but married; lived precariously by chanting psalms for souls of departed. The poem attributed to him is allegorical, the Plowman a personification of Christ; writer is in deadly earnest, flails contemporary abuses in Church and State, and knows the curse of poverty.

Poem is in three forms, possibly rewritten by poet; in alliterative metre with variety and cadence; shows transition from O.E. to modern prosody.

LANGLE DE CARY, FERDINAND LOUIS ARMAND MARIE DE (1849), Fr. soldier, *b.* Lorient; belongs to infantry; was, 1914, member of Supreme Council of War, and was given command of the 4th Army on the Champagne front in the battle of the Aisne and during the offensive of Sept. 1915; was succeeded by General Pétain, 1916; in the early stages of the Verdun fighting, Feb. 1916, was appointed to an inspectorship.

LANGLEY, SAMUEL PIERPONT (1834-1906), airship pioneer and astronomer; *b.* Roxbury, Mass.; *d.* Aiken, S.C. He was a graduate of the Boston Latin School and engaged in architecture and civil engineering, after studying in Europe. For many years he pursued the science of astronomy, first as assistant at the Harvard Observatory, then as director of the Allegheny Observatory. He added materially to existing knowledge of solar heat by his solar observations on Pike's Peak, Mount Etna and Mount Whitney, Cal. 1878-9, invented the bolometer, a delicate device for measuring radiant heat, and established the Astrophysical Observatory at Washington. After 1887 he was Secretary of the Smithsonian Institution and in that year served as president of the American Association for the Advancement of Science. He gave the closest study to the problem of air navigation before the Wright brothers made their early aeroplanes known. The result was a sustained flight in 1896 by a motor-driven aeroplane of his design and construction, and a further machine with which experiments were made in 1903. Congress helped him to pursue his experiments in devising a practical flying machine, with an appropriation of $5,000, but his efforts flagged through criticism and discouragement, and he abandoned his quest. Later the Wright exploits in the air arrested public attention and overshadowed Langley's pioneering work. His device of 1903 was shown to have been built on sound working principles by Glenn Curtiss, who made a successful flight in it at Hammondsport, N.Y., by means of a powerful modern engine. Oxford, Cambridge, Harvard, Princeton, Yale and other universities conferred honorary degrees upon him and he was awarded medals for his services to science by the Institute of France, the Royal Society of London and the U.S. National Academy of Sciences. He wrote *The New Astronomy*; *Experiments in Aero-Dynamics*; and *Internal Work of the Wind*.

LANGREO (43° 17′ N., 5° 44′ W.); town, N. Spain. Pop. 19,000.

LANGRES (47° 53′ N., 5° 20′ E.); fortified town, E. France; episcopal see; XII.-cent. cathedral; Rom. gateway remains. Pop. 9900.

LANGTON, STEPHEN (*d.* 1228); Eng. ecclesiastic; studied at Paris, elected abp. of Canterbury by Canterbury monks, 1207, joined with barons against King John, but it is doubtful how far he was responsible for *Magna Carta*; after John's death supported Henry III.

LANGTRY, LILLIE, LADY DE BATHE (1852), Eng. actress, *dau.* of Rev. W. C. le Breton, Dean of Jersey, hence known as the 'Jersey Lily'; married Edward Langtry, 1874; society beauty; made her début at Haymarket Theatre, London, as Blanche Haye in *Ours*, 1881; has also played Kate Hardcastle in *She Stoops to Conquer*, and Rosalind in *As You Like It*, etc. In 1908 she appeared at the Haymarket as Mrs. Arundel in *A Fearful Joy;* became naturalized in U.S. 1887; married Gerald de Bathe, 1897, who succeeded to the family baronetcy in 1907.

LANGUAGE. See PHILOLOGY.

LANGUEDOC, former province of France. Its capital was Toulouse; boundaries—on the N., Auvergne, Rouergne, Quercy, Forez; on the E., the lower Rhone; on S., the Mediterranean and Roussillon; on W., Comminges, Rivière-Verdun, Foix. L. possessed an Assembly, three archbishoprics, etc. Differing in history and therefore race from N. France, it received above name at time of final union to Fr. Crown, 1271;

when different pronunciation of *oui* was seized on, (*i.e.*) *oc* instead of *oil* of N. Reformation won great hold here in XVI. cent.; from time of Richelieu to Revolution, when it was abolished, L. was administered by royal *intendant*; noted from Rom. times for wines; racial characteristics still strong.

LANGUET, HUBERT (1518-81), Fr. Huguenot statesman; friend of Melanchthon; entered service of Augustus I. of Saxony, 1559; ambassador to Fr. court, 1561-72, and pleaded for Protestants but was compelled to fly; sent to Vienna, but found position untenable; correspondence important hist. source.

LANIER, SIDNEY (1842-81), an American writer and poet, *b.* in Macon, Ga. He graduated from Oglethorpe College, Ga., in 1869, served as a private in Confederate Army during the Civil War, was for a while after that a hotel clerk in Montgomery, Ga., studied law and practiced with his father, in Macon, and in 1879 became lecturer on Eng. literature at Johns Hopkins University, a position he held for the rest of his life. Among his prose works are *Tiger Lilies*, a novel, written during his early life in Montgomery; *The Boy's Froissart*, 1878, and *The Boy's King Arthur*, 1880. Among his best known poems are *Hymns of the Marshes*; *Clover*; *The Crystal* and *The Symphony*.

LANKESTER, SIR EDWIN RAY (1847), Brit. zoologist; prof. at London, 1874-90 and Oxford 1891-8; director of natural history section of Brit. Museum, 1898-1906; president Brit. Association, 1906; works include *Extinct Animals*, 1905; *Kingdom of Man*, 1907; *Science from an Easy Chair*, 1910, 1912, *Diversions of a Naturalist*, 1915; *Secrets of Earth and Sea*, 1920.

LANMAN, CHARLES ROCKWELL (1850), an orientalist, *b.* at Norwich, Conn., son of Peter and Catherine Cook Lanman. He was educated at Yale University, was a graduate student of Greek under Hadley and Sanskrit under Whitney and also studied in Berlin, Tubingen and Leipzig. He taught Sanskrit at Johns Hopkins from 1876-80 after which he was professor of Sanskrit at Harvard for which institution he acquired valuable books and manuscripts (Sanskrit and Pratkrit) while traveling in India in 1889. He also devoted much time to the organized work of promoting oriental and linguistic studies in America, edited many books and was the author of *Beginnings of Hindu Pantheism*, and others.

LANNES, JEAN, DUKE OF MONTEBELLO (1769-1809), marshal of France; served under Napoleon; distinguished at Acre, Montebello, Marengo, Austerlitz, Jena; commanded in Spain, 1808; captured Saragossa; killed at Aspern-Essling.

LANOLIN (*adeps lanoe hydrosus*), a mixture of 7 oz. neutral wool fat with 3 fl. oz. water, the wool fat being obtained by purification of the grease extracted in the preparation of sheep's wool. It is slightly antiseptic, and is a common basis for ointments.

LA NOUE, FRANÇOIS DE (1531-91); Huguenot captain; captured Orleans, 1567; fought in aid of Protestants in Low Countries, 1580.

LANREZAC, CHARLES LOUIS MARIE (1852), Fr. soldier; *b.* at Pointe-à-Pitre, Guadeloupe; belongs to infantry; fought in Loire campaign, 1870-1; prof. and later director of studies at St. Cyr; commanded 5th Fr. Army on right of B.E.F. at outbreak of World War; pressed for earlier offensive in Belgium; when 4th Army retired, leaving his flank exposed, and he was attacked by 3rd Ger. Army in front while 1st Army was turning his other flank, he decided on retirement. Lack of understanding with Sir John French and Joffre led to his replacement by Franchet d'Espérey, end of Aug. 1914. Has pub. many military works, including *Le Manoeuvre de Lutzen*; *Le Plan de Campagne Francais et le Premier Mois de Guerre*, 1920.

LANDSDOWNE, 1ST MARQUESS OF, WILLIAM PETT YFITZMAURICE (1737-1805), Eng. statesman; served in Seven Years War; distinguished at Minden; pres., Board of Trade, 1763; Sec. of State, 1766; dismissed for policy of conciliation towards America, 1768; Premier, 1782.—Henry, 3rd Marquess, 1780-1863, Chancellor of Exchequer, 1806; advocated R.C. emancipation, abolition of slavery; Home Sec., 1827. Subsequently Pres. of Council.

LANDSDOWNE, HENRY CHARLES KEITH PETTY-FITZMAURICE, 5TH MARQUESS OF (1845); lord of Treasury, 1869-72; under-secretary for war, 1872-4; under-secretary for India, 1880; gov.-gen. of Canada, 1883-8; gov.-gen. of India, 1888-93; secretary for war 1895-1900 foreign secretary, 1900-5; minister without portfolio, 1915-16; resigned office with end of Asquith régime.

LANSFORD, a borough of Pennsylvania, in Carbon co. It is on the Lehigh and New England railroads. The city is the center of an extensive coal mining region and its industries, which are important, include the manufacture of silk goods, shirts, garage supplies, etc. Power

is supplied by a large electric power plant. Pop. 1920, 9,625.

LANSING, a city of Michigan, the capital of the State and the county seat of Ingham co. It is on the Grand Trunk, Lake Shore and Michigan Southern and other railroads, and on the Grand River, 85 miles northwest of Detroit. Lansing is the agricultural trade center for the surrounding country. It is also an important industrial community and has manufactures of agricultural implements, flour, stoves, machinery, wagons, trunks, knit goods, etc. The public buildings include the State Hospital, State Library, U.S. government buildings, State School for the Blind and the State Industrial School. Abundant water power is obtained from the river, which is spanned by several bridges. Pop. 1920, 57,327.

LANSING, ROBERT (1864), U.S. Secretary of State, 1915-20, and jurist; *b.* Watertown, N.Y. He graduated from Amherst, in 1886, studied law, and practiced his profession in his native town from 1889 to 1907. The government engaged him as counsel to act in the settlement of a number of important international questions, notably the Bering Sea Fur-Seal Arbitration, Paris, 1892-93; Bering Sea Claims Commission, 1896-97; Alaskan Boundary Tribunal, 1903; North Atlantic Coast Fisheries Arbitration, 1909-10; and the American and British Claims Arbitration, 1912-14. In the latter year he became Counsello for the State Department under the Wilson administration, and shortly afterwards succeeded William Jennings Bryan as Secretary of State, holding that office till 1920. He was dismissed by President Wilson for alleged usurpation of the latter's authority by calling Cabinet meetings during Wilson's illness. The diplomatic correspondence between the U.S. and the belligerents in the World War before the former country entered the conflict made his name of outstanding note as a signatory to many documents of high import and historical value, and he was a figure of equal prominence as a member of the American Commission to Negotiate Peace in Paris at the war's close. He published, 1921, *The Big Four and Others at the Peace Conference*, and *The Peace Negotiations*, a personal narrative.

LANSING-ISHII AGREEMENT, an agreement made in 1917 by Robert Lansing, then Secretary of State, and Baron Ishii, representing Japan, in which the United States recognized the 'special interests' of Japan in China. The Chinese government strongly objected to the agreement and it was a source of controversy and misunderstanding not only on the part of Chinese statesmen but between the American and Japanese governments. By mutual consent the agreement was cancelled in March, 1923. It was superseded by the treaty signed at the Conference on the Limitation of Armaments, known as the nine-power treaty. See CONFERENCE ON THE LIMITATION OF ARMAMENTS.

LANTERN, metal case with glass shutter to protect flame from wind. *Hanging l's* found in Pompeii and Herculaneum have body of bronze and horn plates. *Dark l.* has shutter or slide by which the light may be cut off.

Magic or Optical L., instrument for projecting views on a screen, was invented by Kircher *c.* 1646; consists of body, generally of Russian iron, and a system of lighting, of which the most common is limelight (lime is made white-hot by flame of coal-gas and oxygen), and arrangement for *projection*; a condenser is used for rendering the rays of light parallel, and transparent slides, photographic positives, are introduced between condenser and projector.

LANTERNS OF THE DEAD, erections in France and elsewhere for marking burial-grounds.

LANTHANUM. La. Atomic Weight 139. One of the rare earth metals, first discovered in 1839 by Mosander in the cerite earths. It may be prepared by electrolysis of the fused chloride, and occurs as an iron-grey metal which takes a high polish but tarnishes rapidly in the air, and becomes covered with white hydroxide in the presence of moisture. It has a specific gravity of 6.154 and melts at 810° C. When heated in the air it forms oxide and nitride, and in hydrogen it yields lanthanum hydride. If finely powdered and thrown into a flame, it burns brightly, and also burns in chlorine gas and bromine vapor. With aluminum it forms a white, crystalline alloy, consisting of approximately four parts aluminum to five parts lanthanum.

LANUVIUM (41° 41′ N., 12° 42′ E.), ancient town, near Rome, Italy; had famous temple. Modern Civita Lavinia.

LANZAROTE (29° N., 13° 34′ W.), volcanic island, Canary Islands, Atlantic; chief town, Arrecife. Pop. *c.* 18,000.

LANZI, LUIGI (1732-1810), an Italian archæologist, was educated by the Jesuits for the priesthood, but the order being supressed, he became keeper of the galleries of Florence, 1775, and henceforward devoted his life to litera-

ture and the study of antiquities. His *Storia Pittorica della Italia*, completed in 1796, has been widely translated, and in that it was the first attempt to treat the schools of painting with historical sequence, is a landmark in art criticism. L. wrote also on the language and vases of ancient Etruria.

LAOAG (18° 10′ N., 120° 35′ E.), town, Luzon, Philippine Islands; exports rice. Pop. *c.* 36,000.

LAOCOÖN, in Gk. mythology Trojan priest and patriot; slain with his two sons by twin snakes sent by Poseidon; statue, in late Gk. style, representing his death-struggle, is preserved in the Vatican.

LAODICEA.—(1) (37° 49′ N., 29° 2′ E.), town, Asia Minor; traditionally founded by Antiochus II., III. cent. B.C.; one of seven churches of St. John's Revelation. Modern Dinizli. (2) (35° 30′ N., 35° 44′ E.), town, Syria; built by Seleucus I.; modern Latakia. (3) (34° 33′ N., 36° 30′ E.) or Tell Neby Mindu, ruined town, Palestine.

LAON, chief town of Aisne, France (49° 34′ N., 3° 36′ E.), 22 m. S.E. of St. Quentin; important fortress since Roman times; fine 12th cent. Gothic cathedral on a hill; linen and metal goods; was residence of Carolingian kings in 10th cent.; in hands of English, 1419-29; capitulated to Germans in 1870; captured by Germans in World War during advance towards Paris, Sept. 1914; was objective of Nivelle's fruitless attack during second battle of Aisne, April 1917; in Sept. 1918 Mangin pushed forward within striking distance of the city; recovered by French on withdrawal of enemy to Hunding Line, Oct. 5, 1918. Pop. 15,400.

LAOS (*c.* 16° N., 105° E.), region, central Indo-China, partly under Fr. protection, partly subject to Siam; bounded by Yunnan, Tongking, Annam, Cambodia, Siam, Brit. Shan States. Produces rice, cotton, tobacco, sugar-cane, fruits, indigo. Fr. L., acquired 1892, has area *c.* 98,000 sq. miles. Pop. 670,000. Capital, Vien-tiane.

LAOS, or **LAOTIONS**, inhabitants of Indo-China, chiefly in Siam and Burma. An amiable and civil race, mostly Buddhists in religion. Conquered by the Siamese, 1828, but a few tribes are still practically independent. 'Lao' meant originally 'man.'

LAO-TSZE (*b.* 604 B.C.); Chinese philosopher; founder of Taoism; see CHINA, *Literature*.

LA PAZ (16° 27′ S., 67° 52′ W.), department, Bolivia, S. America; area, *c.* 53,800 sq. miles; produces coca, coffee, rubber, copper, tin. Pop. 725,000.

LA PAZ, LA PAZ DE AYACUCHO (16° 29′ S., 67° 59′ W.), capital, Bolivia, S. America; important commercial city; copper, alpaca, wool, cinchona; contains an unfinished cathedral. Here Spaniards were defeated by revolutionaries during War of Independence. Pop. *c.* 110,000.

LA PÉROUSE, JEAN FRANÇOIS DE GALAUP, COMTE DE (1741-88), Fr. explorer; destroyed Eng. forts in Hudson's Bay, 1782; sought N.W. Passage, 1785-88, after which he was no more heard of till 1826, when remains of expedition were found.

LAPIS LAZULI, a metal, sometimes called 'azure stone,' composed of silica and alumina with traces of sulphuric acid, soda, and lime; generally of a rich blue color, although some varieties are of tinted green, red, or violet; has vitreous lustre, is opaque, and easily broken; sometimes spotted, or banded with white. Found associated with crystalline limestone in schists or granites, in Persia, Siberia, Tibet, Chile, Andes, China, and Asia. Used by ancients for ornamental vases; now for mosaics and for manufacture of ultramarine pigment.

LAPLACE, PIERRE SIMON, MARQUIS DE (1749-1827), Fr. mathematician and astronomer; *b.* Beaumont-en-Auge; *s.* of farmer; at early age teacher of math's at military school of native town; when eighteen, went to Paris, where, through influence of D'Alembert, was app. prof. of math's at École Militaire; entered politics; cr. count by Napoleon, and app. Minister of Interior, but dismissed for incapacity after six weeks; in spite of many favors, he voted for Napoleon's dethronement in 1814; cr. Marquis by Louis XVIII. in 1817. In friendly rivalry with Lagrange, L. devoted his remarkable analytical powers to astronomical problems. He was the first to firmly establish the stability of the solar system, and his *Mecanique Celeste* ranks only second in importance to Newton's *Principia*. Its publication gained him a world-wide reputation. In *Systeme du Monde* is to be found his famous 'nebular hypothesis.'

LAPLAND, LAPPLAND (*c.* 68° N., 27° E.), region in extreme N. of Scandinavia and extending eastward to White Sea; has no separate political existence; surface of Scandinavian L. is mountainous, with deeply indented coasts and large lakes between the mountain ridges; Russ. part is com-

paratively level, with greater number of lakes while a considerable area is covered by marshes and forests; crossed by Tana, Kemi, and other rivers. Summer lasts for three months, during which there is perpetual daylight; and for two months in winter darkness prevails. Lapps are a race of short stature, but of great endurance; they are generally hospitable and quiet, but are addicted to drunkenness, and are uncleanly in their personal habits. Of their early history little is known; since IX. cent. they have been in subjection to Norway, Sweden, or Russia, and for several cent's they were regarded as slaves. They are generally classified as Mountain, Forest, Sea, and River Lapps. Mountain Lapps are virile and energetic; a nomadic race, their wants are almost entirely supplied by the reindeer. Forest Lapps lead a less nomadic existence—live by hunting and fishing, and keep reindeer. River Lapps are a settled people, who engage to slight extent in agriculture, and Sea Lapps are an impoverished race who live by fishing. Language resembles Finnish. Religions —Lutheran, Gk. Church. Total number of Lapps, *c.* 30,000. See MAP OF EUROPE.

LA PLATA (35° S., 57° 56′ W.), town, Argentina, S. America; harbor; manufactures cottons, woolens; seat of univ. Pop. 95,000.

LAPORTE, a city of Indiana, in Laporte co., of which it is the county seat. It is on the Lake Shore and Michigan Southern, Pere Marquette, and other railroads. It is the trade center for an extensive agricultural region. Its industries, which are important, include the manufacture of woolen goods, agricultural implements, wheels, etc. Laporte is an attractive summer resort and has in its neighborhood several lakes. Its public buildings include a courthouse, city hall, and public library. Pop. 1920, 15,158.

LAPRADE, PIERRE MARTIN VICTOR RICHARD DE (1812-84), Fr. poet; follower of Lamartine, and, like him, dealt with themes of nature, religion, and philosophy; has resemblance to Wordsworth, and, like him, distinguished exponent of aims of Romantic school.

LARA (*c.* 10° N., 69° 30′ W.), state, N.W. Venezuela, S. America; silver mines; produces cereals, tobacco, coffee; chief town. Barquisimeto. Area, 9296 sq. miles. Pop. *c.* 275,000.

LARAMIE, a city of Wyoming, in Albany co., of which it is the county seat. It is on the Union Pacific and the Colorado, Wyoming and Eastern railroads, and on the Laramie river. It is the trade center for an extensive stock raising and mining region and in the neighborhood are large deposits of gold, silver, lead, graphite and other minerals. Its industries, in addition to mining, include rolling mills and machine shops. It is the seat of the State University and the State Penitentiary. Here also is the State Fish Hatchery. The public buildings include a public and college library, and a hospital. Pop. 1920, 6,501.

LARAMIE MOUNTAINS, a spur of the Rockies, running through Wyoming and Colorado, bounding Laramie Plain on the east. Mount Laramie is the most prominent peak, with an altitude of 10,000 feet. Coal has been found in the foothills of this range, but has not yet been mined extensively.

LARAMIE RIVER, a stream about 200 miles in length which rises in northern Colorado, flows northeasterly and empties into the North Platte at Fort Laramie, in Wyoming.

LARBERT (56° 1′ N., 3° 51′ W.), town, Stirlingshire, Scotland; coal. Pop. of parish, 1911, 14,000.

LARCENY. See THEFT.

LARCH (*Larix*), a genus of hardy coniferous trees which possess deciduous foliage. This develops in the early spring, the leaves arising in two rows of dense, bright green clusters on the lateral shoots, and giving the plant a graceful and dainty appearance. The male cones are small, short-lived, oval structures, while the female cones, which mature in one year, are much larger. They are readily recognized, when young, by their red color. The common European species, *Larix europoea*, is extensively cultivated for its timber, which is used in shipbuilding, and for railway sleepers, etc., whilst the bark is employed in tanning. *L. americana* is the Amer. black l., a species commonly grown in the New World, while among other species are *L. Ledebourii*, Russia, and *L. leptilepis*, Japan.

LARCOM, LUCY (1826-93), an Amer. poet, *b.* in Beverly, Mass. She was at first a factory worker in Lynn, Mass. and at this period of her life began writing for a local publication. Her contributions attracted the attention of Whittier, the poet, who made her acquaintance and later collaborated with her in the compilation of *Child Life* and *Songs of Three Centuries*. Thus encouraged, she studied at Montecello Seminary, in Godfrey, Ill., taught school for a while and afterwards became editor of *Our Young Folks*, a Boston publication which later was merged with St. Nicholas. She wrote *Ships in the Mist, and Other*

Stories, 1859; *Wild Roses of Cape Ann, and Other Poems*, 1880, and *A New England Girlhood Outlined from Memory* (an autobiography), 1899.

LARD, the fat of the hog melted down and strained, and the best quality is prepared from the leaf or fat of the bowel and kidneys. L. should contain about 60 per cent. of olein, and 40 per cent. of palmitin and stearin. Adulteration is frequently resorted to in the manufacture of this commodity, the stearin of beef or mutton being used. The best quality of L. is used for making oleomargarine.

LARDNER, RING W. (1885), an American writer, *b.* at Niles, Mich., s. of Henry and Lena Bogardus Phillips Lardner. He was educated at Niles High School and at Armour Inst. Tech., Chicago. He was a reporter for the South Bend, Ind. Times 1905-7 after which he was a sporting writer for various leading American newspapers including the Chicago Tribune, 1913-19 and then became a writer for the Bell syndicate. Author *You Know Me Al*, 1915; *Gullible's Travels*, 1917; *Treat 'Em Rough*, *The Real Dope* and *My Four Weeks in France*, 1918; *The Young Immigrunts*, 1919 and *Symptoms of Being 35*, and *The Big Town*, 1921.

LAREDO, a city of Texas, in Webb co., of which it is the county seat. It is on the International and Great Northern, the Mexican Central and other railroads, 153 miles W. of San Antonio. It is the trade center for the region bordering the Rio Grande River. It is in the great Rio Grande coal belt. Its rarified climate makes it a favorite health resort for victims of lung trouble. It is the seat of Laredo Seminary and it has two hospitals. Its industries include the manufacture of lumber and cigars. In the neighborhood are deposits of coal, iron, lead, zinc and copper. Laredo has an extensive trade with Mexico. During the troubles on the Mexican border it was one of the headquarters for American troops. Pop. 1920, 22,710.

LARES, Rom. deities of the household and family and of roads and cross-roads. The Lares being guardians of the house, were intimately associated with the penates, or guardians of the store.

LARGUS, SCRIBONIUS (*fl.* in I. cent. A.D.), physician to Emperor Claudius; collected a large number of his own and other medical prescriptions (*Compositiones*), a work still studied.

LARISSA (39° 36′ N., 22° 24′ E.), city, Thessaly; many mosques; manufactures silk, leather, cotton. Ceded to Greece by Turks, 1881. Pop. 18,200.

LARISTAN (27° 45′ N., 54° 30′ E.); division of Fars province, Persia; area, *c.* 20,000 sq. miles. Pop. *c.* 90,000.

LARK, the popular name given to the species of Alaudidae, a family of passerine birds inhabiting the Indian, Palæarctic, and Ethiopian regions, *Otocorys* being the only American genus, and *Mirafra* the only Australian one. *Alauda avensis*, the familar British skylark, nests in a hollow in the ground, usually among grass or cereals. Its rapid, pleasing trill is generally uttered while the bird is soaring, and occasionally it emits a plaintive call. *A. arborea*, the woodlark; *A. cristata*, the crested lark; and *A. alpestris*, the shore lark, belong to the same family.

LARKHALL (55° 45′ N., 3° 59′ W.); town, Lanarkshire, Scotland; coal mines. Pop. 15,000.

LARKHANA (27° 27′ N., 68° 8′ E.); town, Bombay, India. Pop. 15,500. L., district, pop. 660,000.

LARKSPUR. See DELPHINIUM.

LARKSVILLE, a borough of Pennsylvania, in Luzerne co. It is on several railroads and on the Susquehanna River. It is surrounded by an extensive coal mining district and its industrial interests are chiefly concerned with coal mining. Pop. 1920, 9,238.

LARNED, JOSEPHUS NELSON (1836-1913) an American writer, *b.* Chatham, Ontario, Canada. For some years he was on the reportorial and editorial staff of the Buffalo Express, being editor of that paper during 1869-72. For one year he was superintendent of public education in Buffalo, then, for twenty years, libarian of the Buffalo Public Library. He wrote *The Literature of American History*, 1902; *Talks About Labor*, 1877; *Seventy Centuries*, 1905, and *A Study of Greatness in Men*, 1911.

LARNED, LINDA HULL (1853), household economist, *b.* at Little Falls, N.Y., daughter of David Henry and Mary Matilda Schermerhorn Hull. She was educated at Keble School, Syracuse, N.Y. She began speaking in 1898 upon the subject of household economics. She was a member of the executive board of the New York State Federation from 1899-1901, was official delegate to Paris Expn., 1900 and was also a member of the National Household Econ. Assn. Author: *The Little Epicure*, 1895; *The Hostess of Today*, 1899; *The New Hostess of Today*, 1913; *One Hundred Salads*,

1914; *One Hundred Cold Desserts*, 1914; *One Hundred Luncheon Dishes*, 1915 and was a contributor to magazines. Married Samuel B. Larned of Syracuse in 1874.

LARNED, WILLIAM TROWBRIDGE an American writer, *b.* at St. Louis, son of Charles Trowbridge and Philomena S. Smith Larned. He was educated by private tutelage and studied for one year at Georgetown University, D.C. From youth he contributed verse, essays and short stories to newspapers and magazines. He spent quite some time in the western United States as a cowboy and later farmer and cattle raiser after which he was connected with various newspapers including night city editor and 3 years dramatic and music editor of the St. Louis Republic, and editor of the New York Evening Mail Illus. Supplement, 1906. Author: *American Fairy Tales*, *Arabian Fairy Tales*, etc.

LA ROCHEFOUCAULD, FRANÇOIS DE (1613-80), Fr. author; descendant of one of greatest Fr. families. As Prince de Marcillac spent first part of his life in plots against Richelieu and Mazarin; left ill and ruined after Civil War of *Fronde*; retired for ten years to his castle, where he wrote his *Memoirs*; at fifty returned to society at Madame de Sablé's *salon*. Apothegms being then the fashion, La R. for ten years composed improved with help of the *Precieuses* his own famous *Maximes*, 1665, which still retains charms of wit, paradox, and sense of spacious intellect.

LA ROCHEFOUCAULD-LIANCOURT, FRANÇOIS, DUC DE (1747-1827), Fr. philanthropist; fled at Revolution; visited U.S., 1795-97, and pub. account; returned under Napoleon, and labored at introduction of vaccination; established first Fr. savings-bank.

LA ROCHEJACQUELEIN, DE, Fr. family; Royalists during and after Revolution. Henri, Comte de la R., 1772-94, headed Vendéan rising. Louis Marquis de la R., *d.* 1857, tried to organize another Vendéan rising, 1815.

LA ROCHELLE (46° 9′ N., 1° 9′ W.), port, W. France; episcopal see; has old episcopal palace now used as museum, and XVIII.-cent. cathedral; strongly fortified; was Huguenot stronghold in XVI. and XVII. cent's, and successfully resisted siege in 1572-73. Manufactures glass, cotton yarns, brandy; shipbuilding. Pop. 35,000.

LA ROCHE-SUR-YON (46° 40′ N., 1° 27′ W.), town, Vendée, France. Pop. 14,000.

LAROUSSE, PIERRE ATHANASE (1817-75), a celebrated French lexicographer, born at Toucy. His fame rests principally on his *Grand Dictionnaire universel du XIXe Siecle*, a vast compilation of fifteen volumes of a discursive and entertaining rather than a scholastic and critical nature, which had an enormous success. He also wrote various text-books, his aim being to aid the pupil to think for himself rather than to depend on his memory. Other works are *Nouveau Dictionnaire*, and *Dictionnaire complet illustre*. L. also founded a journal of instruction, *L'Ecole normale*.

LARSA (31° 33′ N., 45° 53′ E.), ancient city of Babylonia; site marked by ruins of Senkera.

LARVA (Lat., a ghost, a mask), the name applied, first of all by Linnæus, to the young form of any animal which has left the egg and which at that stage does not resemble the parent. It is given more particularly to insects, but refers also to tadpoles of frogs, nauplii and zoeæ of crustaceans, the young of echinoderms, etc. The larvæ of Orthoptera and Hemiptera bear a strong resemblance to the imago, or perfect insect, except in the possession of wings, and the metamorphosis is slight. Lepidoptera in the larval form possess a head, legs, and prolegs, and are popularly known as caterpillars; the larvæ of Coleoptera, which have heads and may or may not have legs, are called grubs; and those of Diptera, which are legless and frequently without a head, are called maggots.

LARVAL FORMS, LARVÆ, young independent stages which differ in essential structure from their adult form. Some are well known, (*e.g.*) the caterpillar and chrysalis stages of the butterfly, and many insects exhibit this two-staged youth, while most show modifications of this cycle, a quiescent period, or at least a period of moulting, preceding the attainment of adult characters.

It is among aquatic and especially marine organisms, however, that larval forms are most common and most diverse. Among such groups as Coelenterates, Echinoderms, Worms, Arthropods, Molluscs, and among the Vertebrates — Tunicates, Cyclostomes, and Amphibians—all or any of the members reach adult life by indirect routes through larval bypaths.

LARYNGOSCOPE, an instrument by which the condition of the larynx may be observed. It consists of a small mirror attached to a long handle at an

angle of about 120°. The instrument is first warmed to prevent obscuration by the condensation of moisture, and then introduced into the throat with its back against the soft palate and uvula. At the same time a strong light is directed against the mirror from a lamp placed on the shoulder or forehead of the observer, so that the light is reflected towards the larynx and back again to the mirror. By this means the extent of laryngeal inflammation or the presence of foreign bodies can be determined and suitable treatment decided upon. The instrument was first used by Manuel Garcia to examine the state of the larynx in singing, and was adapted to medical purposes by Dr. Czermak of Pesth.

LARYNGITIS, inflammation of the mucous membrane of the larynx, may be *acute* or *chronic*, the former being usually due to exposure to cold or overuse of the voice, characterized by swelling of the mucous membrane of the throat, with at first diminished and then increased secretion, cough, sore throat, and huskiness of voice—the treatment being rest in bed, warmth, inhalation of steam with benzoin, and a purge; while chronic l. may be due to a preceding acute attack, to persistent strain of the voice, and chronic irritation, such as tobacco-smoke, the symptoms being the same as in acute, but more persistent, and treatment rest, change of air, care of general health, and application of an astringent to the throat. *Oedema glottidis* is a serious condition due to extension of inflammation from neighboring parts, to injury by a corrosive or boiling water, or to septic infection often associated with scarlatine or other fever. The mucous membrane is very swollen, there is breathlessness, and suffocation may occur. The patient in this case is ordered to suck ice, the affected part is scarified and sprayed with ether, and tracheotomy (an incision into the trachea) may be necessary. See CROUP.

LARYNX, the organ of voice, is situated in upper part of the neck, communicating below with the windpipe, above with the pharynx. It is a sort of box, formed by a framework of five large cartilages: (1) *thyroid* cartilage, whose apex forms the prominence, *Adam's apple*; (2) *cricoid* cartilage, a ring below; (3) the *epiglottis*, a thin plate projecting from the thyroid cartilage into the pharynx; (4) two *arytenoid* cartilages, joined to the back of the thyroid cartilage. On each inner side of the l. are two pairs of folds. The free borders of the upper pair cover delicate fibrous bands, the false vocal cords, while the strong bands in the lower folds are the true *vocal cords*. The air from the windpipe plays directly on the vocal cords, causing them to vibrate, thus causing a note. The tenseness of the cords and size of the opening are controlled by muscles.

LA SALLE, a city of Illinois, in La Salle co. It is on the Illinois Central, the Chicago, Rock Island and Pacific, and the Chicago, Burlington and Quincy railroads, and on the Illinois river, 99 miles S.W. of Chicago. It is the chief center of an extensive commerce by river, canal and rail. It is also surrounded by a rich bituminous coal region. Its industries include coal mining, zinc smelting and the manufacture of sulphuric acid, hydraulic cement, sewer pipe, pressed brick, etc. Its public buildings include a hospital and a public library. Pop. 1920, 13,050.

LA SALLE, or **SALE, ANTOINE DE** (*c.* 1398—*c.* 1461), Fr. poet; completed *Petit Jehan de Saintre*, 1456, a skillful satire on mediæval chivalry; reputed author of anonymous masterpieces of Middle Ages—*Les cents nouvelles nouvelles*, stories of kind of *Decameron*, and *Les Quinze joies du mariage*.

LA SALLE COLLEGE, a Roman Catholic institution of learning founded in Philadelphia, Pa., in 1863, by the Brothers of the Christian Church. It grants degrees of B.A., B.S. and M.A. The buildings and grounds are valued at about $125,000. In 1921-22 the faculty numbered 22 and the student body 400.

LA SALLE, RENÉ ROBERT CAVELIER, SIEUR DE (1643-87), Franco-Canadian traveler; *b.* Rouen; set out on expedition to discover mouth of Mississippi, 1678; crossed Canada to Lake Michigan, erecting forts; occupied Arkansas, entered valley of Illinois, descended Mississippi to Gulf of Mexico, 1682, naming province through which it flowed, *Louisiana*; returned, 1684, to found port at mouth of stream; small colony failed and L.S. was murdered by a follower.

LAS BELA, LUS BEYLA.—(1) (26° 10′ N., 66° 25′ E.), small state, S.E. Baluchistan; triangular alluvial land on delta of Purali; bounded by Khirthar range on E. and Hala Mts. on W.; area, 6357 sq. miles. Pop. 60,000. (2) Capital of above; burial-place of Sir Robert Sandeman. Pop. *c.* 6000.

LAS CASAS, BARTOLOMÉ DE (1474-1566), Span. prelate; called 'The Apostle of the Indians'; endeavored to secure better treatment of Indians by Spain; bp. of Chiapa, Mexico, 1544-47.

LAS CASES, EMMANUEL AUGUSTINE DIEUDONNE MARIN JOSEPH (1766-1842), a French officer and historian, the companion of Napoleon at St. Helena, *b.* near Revel, Languedoc. Served in Conde's army in 1792, and then spent some time in England, and fought for the royal cause at Quiberon, 1795. He returned to France at Napoleon's accession, and worked at his famous *Atlas historique*, published under the name of Lesage. After Waterloo he shares Napoleon's exile, and published the ex-emperor's memoirs, under the title of *Memorial of St. Helena.*

LASKER, EMMANUEL (1868), Ger. chess player; first attracted attention in 1883; defeated Blackburne, 1892, and Steinitz, 1894; first prizes in tournaments in several cities, 1892-1900. Renounced title of Champion of the World to Capablanca, 1920. Has written *Common Sense in Chess*, 1896; founded, 1904, *Lasker's Chess Magazine.*

LASKI, HIERONYMUS (1496-1542), diplomat; entered John Zapolya's service, for whom he gained aid of Turks; established Zapolya's position on Hungarian throne.

LAS PALMAS (28° N.; 15° 41′ W.), capital, Grand Canary Islands; episcopal see; seat of government; cathedral. Pop. 55,000.

LASSA. See LHASSA.

LASSALLE, FERDINAND (1825-64), Ger. socialist; *b.* Breslau; prosecuted Countess Hatzfeldt's suit against her husband; pub. work on Heraclitus, 1858; *System der erworbenen Rechte*, 1861; helped to found Social Democratic party in Germany, adopting career of agitator; chief aim was to improve conditions of working class; founded *Allgemeiner Deutschev Arbeiterverein*; wrote pamphlets and made speeches in large towns, attaining greatest success in Rhine country; involved in several state prosecutions; *d.* from result of duel.

LASSITER, WILLIAM (1867), U.S. army officer, *b.* at Petersburg, Va., son of D. W. and A. H. Lassiter. He graduated from the United States Military Academy in 1889 and from the Artillery School in 1894. After serving on various duties and stations including participation in the capture of Santiago, 1898, he joined the A.E.F. in France in 1918 with the rank of major-general and participated in the Aisne-Marne offensive, St. Mihiel offensive and also served in the Toul sector, after which he commanded the 32nd Div. in march to Rhine and occupation of the Coblentz bridgehead. In 1919 he returned to the U.S. and was assigned as col. to Gen. Staff Corps. and was asst. chief of staff in charge of operations and training after 1921.

LASSOO, LARIAT, strip of plaited hide, used in America for purposes of capture; flung in noose over animal's head, end retained in hand.

LASSUS, ORLANDUS, ORLANDO DE LASSO (*c.* 1530-94), Belg. composer; *b.* Mons; chorister in the church of Nicholas; app. director of the choir of the Lateran, Rome, *c.* 1551; master of the court chapel, Munich, 1562-94; prolific composer, over 2000 works, and one of the greatest musicians of the XVI. cent.; masses, sacred motets, madrigals, chansons.

LAS VEGAS (35° 35′ N., 105° 20′ W.), town, New Mexico; thermal springs in vicinity. Pop. 4,000.

LATAKIA (35° 53′ N.; 35° 46′ E.), port, Syria; produces tobacco of same name, which is extensively used in blending. Pop. *c.* 22,000. See also LAODICEA.

LATANÉ, JOHN HOLLADAY (1869), an American university professor, *b.* at Staunton, Va., son of Bishop James Allen and Mary Minor Holladay Latané. He was educated at Baltimore City College and at Johns Hopkins University. He began teaching in 1895 and was afterwards professor of history, English and economics of various American colleges and universities until 1913 when he became professor of American history and head of the department of history at Johns Hopkins University of which institution he was made dean of the college faculty in 1919. He contributed articles on international law and diplomacy to reviews and was the author of: *From Isolation to Leadership*, 1918; *The United States and Latin America*, 1920 and others.

LATEEN, triangular sail, used in Mediterranean.

LATENT HEAT, the heat that enters a substance during the process of liquefaction, or of vaporization. The application of heat ordinarily raises the temperature of a body, but when a change of state is imminent, it is found that heat is applied without any corresponding change in the thermometric reading until the change is complete. On the old assumption that heat was an imponderable substance introduced into the body heated, such heat was called 'latent'; that is, it concealed itself from the thermometer. The principle has important applications. For instance, water on evaporating abstracts heat

om surrounding bodies; hence the nger of chill when moisture is allowed dry from one's clothing. Conversely, at is given out when a vapor con-nses, or when a liquid solidifies. The H. of fusion of ice is about 80; that it takes 80 times the amount of at required to raise the temperature ice or water 1° C. to melt the same ight of ice at 0° C. The L. H. of porization of water is about 536.

LATERAN COUNCILS, held at Rome the church of St. John Lateran. 1st, 1123, confirmed Concordat of Worms; d, in 1139, settled papal schism; 3rd, 1170, settled conflict between Empire d papacy; declared war against Cath-; 4th, in 1215, formulated doctrine transubstantiation. 5th, in 1517, serted superiority of pope over coun-s.

LATERITE, a red-brown earthly posit occurring on various igneous and histose rocks, caused by decomposition ring to exposure to natural forces. ost noticeable in tropics, probably ring to greater heat and tropical rains.

LATHE, contrivance by which various aterials are 'turned' or polished; rked by means of foot-treadle or echanical power.

LATHROP, GEORGE PARSONS 851-98), an American writer, *b.* in e Hawaiian Islands and educated in ew York and Dresden, Germany. For while he was assistant editor of the lantic Monthly Magazine, then editor the Boston Courier. He married se Hawthorne, a daughter of Nathan-Hawthorne. Among his works are *se and Roof-Tree* (poems) 1875; *In Distance*, 1882; *Dreams and Days* erse, 1892), and *The Gold of Pleasure*, 02.

LATHROP, JULIA CLIFFORD, 58), an American philanthropist, *b.* in ckford, Ill. She graduated from ssar College, in 1880. Since 1899 she spent much time as a voluntary ident of Hull House, in Chicago. She made a special study of the care of insane, the better education of chil-n and juvenile courts and has made eral visits abroad and is Director of ildren's Bureau, U. S. Government. is the author of numerous articles reports on the care of the insane, l service, child welfare, etc.

ATHROP, ROSE HAWTHORNE 51), an American author, the *dau.* Nathaniel Hawthorne, *b.* in Lenox, ss. She studied art in London and sden, and in 1871 married George on Lathrop, a writer, with whom she collaborated in much of her later literary work. In 1891 she established St. Roses Free Home for Cancer Patients and Rosary Hill Home, in New York, a Dominican community, assuming the name of Mother Mary Alphonsa. She wrote *Along the Shore* (poems, 1888) and *Memories of Hawthorne* (with her husband), 1897.

LATIMER, HUGH (1490-1555), Eng. religious reformer; *s.* of Leicestershire yeoman; ed. at Cambridge; began to preach against ecclesiastical abuses; prohibited by bp. from preaching in diocese of Ely; made royal chaplain by Henry VIII.; became rector of West Kington, Wiltshire, 1531; tried for heresy and imprisoned, 1533, but on king's throwing off papal authority became his adviser; burned during Marian persecution.

LATIN CHURCH. See ROMAN CATHOLIC CHURCH.

LATIN EMPIRE. See BYZANTINE EMPIRE.

LATIN LANGUAGE was the tongue spoken in Rome and in the plains watered by the Tiber in the VI. cent. B.C., but of whose previous existence we have no records. The Lat. language belongs to the so-called *Centum* group of the Indo-European languages. It has prominent features in common with Greek, and a still closer relationship with the Celtic group—(*viz.*) Gaelic (Irish and Scots), Manx, the language of ancient Gaul, Welsh, Cornish, and Breton. Kindred dialects were spoken in the districts bordering on Latium, (*e.g.*) Umbrian, Oscan, and Sabellian. The Lat. language, like the other Indo-European languages, is synthetic and inflectional. The declensions of nouns in Latin are 5 in number. There are 2 numbers—singular and plural. Unlike Greek, it has lost the dual, though *duo*, 'two,' and *ambo*, 'both' are relics of the dual number. The cases are nominative, vocative, accusative, genitive, dative, and ablative, with traces also of the old locative. There are 3 genders—masculine, feminine and neuter. The verb has active and passive voice, but no middle, and thus is poorer than the Greeks. In moods, too, Lat. is deficient, having no optative, though it retains the indicative, imperative, subjunctive, infinitive, and the participial (incomplete; in active, only present and future; in passive, only past). The present, future, perfect, imperfect, pluperfect, and future-perfect moods are preserved, but the aorist is wanting. Lat., however, has two unique developments of the verb, (*i.e.*) the gerund and gerundive.

LATIN LITERATURE

The supremacy of Lat. over the other dialects of Italy was posterior by a considerable period in the supremacy of power. The remains at Pompeii show that the Oscan dialect was not dead there in 79 A.D., the date of the fatal eruption. The various dialects had great influence on the development of the language.

The development of Lat. is usually considered by dividing its history into 5 periods, (*viz.*); (1)*c.* 500-240 B.C. To this period belong our earlier evidences of the written language—mainly inscriptions. Lat. has not yet taken literary form. (2) 240-70 B.C. The Lat. dialect is now becoming victorious over the neighboring dialects. The Social War resulted in Lat. replacing many dialects. Gk. culture and learning has reached Rome, and its influence has re-shaped Lat. and made it a fit vehicle for literary expression. (3) 70 B.C.-14 A.D., The Golden Age of Lat. letters—the age in which prose reached its highest excellence in Cicero's writings, and verse its supreme beauty in Vergil. (4) 14 A.D.-180 A.D., The Silver Age, in which the language fast lost its purity. (5) 180 A.D. to the date of the disintegration of Lat. into the Romance languages. This period includes the development of ecclesiastical Lat.

Lat. cannot be compared in versatility with Greek. Its poverty in particles and verb forms makes it incapable of expressing the delicate shades of meaning so characteristic of the subtlety of Gk. thought. But it is a language of inimitable solemnity, lucidity, and precision, and, when its unpromising beginning is considered, its influence and development are marvelous.

LATIN LITERATURE developed on lines directly opposed to those along which the lit. of Greece evolved. Lat. lit. was shaped according to imported models; Gk. lit. was a spontaneous growth. The various species of Lat. composition arose according to no law; the various species of Gk. composition arose according to a natural order. The making of Lat. lit. was Gk. culture; the making of Gk. lit. was Gk. creative genius.

The capture of Tarentum, 272 B.C., is the great landmark in the history of Rom. letters. The imported Gk. slaves began to create a new lit. at Rome in imitation of the Gk. masterpieces. Previously, however, there had been the seeds of an indigenous lit. in the Lat. tongue. Inscriptions on busts and tombs were the beginnings of Lat. prose. The Songs of the Fratres Arvales and other land charms were a rude form of verse. Saturnian verse, a native metre, was employed in hymns to the gods and in the Fescennine verses sung at harvest festivals. Lastly, the dramatic *Satura*, a medley on all topics, with a strong vein of satire, were the origin of the purely Rom. product—Satire.

The history of Lat. lit. opens with the name of Livius Andronicus, a Gk. slave from Tarentum, brought to Rome, 272 B.C. He translated the *Odyssey* into Saturnian verse, and also translated some Gk. tragedies and comedies into Lat. But the father of native Rom. poetry was really Nævius. His *Bellum Punicum* paved the way for the great epics of Ennius and Vergil. The comedies of Plautus are vigorous performances based on the new comedy of Athens, but their originality in spirit and humor is undeniable. Ennius, the author of the epic called the *Annales*, took a great step in the history of Lat. prosodic development. His poem was written in Lat. hexameters and not in Saturnian metre, like the epic of Nævius. Vergil borrowed freely from the *Annales*. Cicero's poetry was Alexandrian in school that preferred the recondite to the simple, the learned to the natural. The *De Rerum Natura* of Lucretius is difficult to classify. It is didactic and philosophical in theme, and shows the influence of the Alexandrian school, but it is fired by a genuine passion that lifts it far above all contemporary writing and places it among the masterpieces of the world.

Meantime Lat. prose has been advancing in the hands of Cæsar, Sallust and Varro, but to Cicero belongs the crown of excellence. His prose is a model of style for all time and for writers in all languages. A poet contemporaneous with Lucretius, but of very different temperament is Catullus. Catullus is essentially a lyric poet, and a lyric poet of the first order.

The influence of the Imperial policy of Augustus on Lat. letters is inestimable. As in the institutions of Rome so in other lit. the new era marked a complete reversal of the old traditions. The imperial patronage fostered and directed the poet's talents. Thus the *Aeneid* of Vergil set a halo upon the new administration and traced the new order to the inconvertible decrees of the gods. Horace did for Augustus in lyric what Vergil did in epic. The Augustan age is the golden age of Rom. lit., but in it lay the seeds of dissolution.

The age that followed produced great writers like Tibullus, Propertius, Ovid and Livy, but style is becoming formost and matter secondary—the age of rhetoric is at hand, the age that produced wooden poets like Statius, Lucan and Seneca, and whose only possible

greatness lay in satire such as Juvenal's and invective such as Tacitus's.

LATITUDE AND LONGITUDE. (1) *Latitude* of a place on the earth's surface is its angular distance from the equator (represented by 0°) measured N. or S. along a meridian. It is found by an observation of altitude of sun at noon, and a reference to Nautical Almanac for sun's distance from celestial equator on that day. Length of degree of latitude is a little greater at the poles than at equator; average value, nearly 69½ m. (2) *Longitude* of a place is its distance, measured E. or W. from a given meridian; the arc of the equator intercepted between the meridian of the place and the *first* or *prime* meridian. In Britain longitudes are reckoned from the meridian of Greenwich. The two measurements (latitude and longitude) definitely fix any position on land or sea.

LATIUM, district round ancient Rome; bounded N. by Eturia, E. by Samnium, S. by the Liris, W. by the Tyrrhenian Sea; *c.* 370 B.C. 30 towns belonged to the Latin League which was shortly afterwards dissolved by Rome (*q.v.*). The *Latini*, akin to the Romans racially, helped to form the *plebs* of Rome.

LA TOUR D'AUVERGNE, THÉOPHILE MALO (1743-1800), Fr. grenadier; distinguished in wars, 1792-1800; wrote on Breton language; killed at Oberhausen.

LA TRAPPE. See TRAPPISTS.

LATROBE, a borough of Pennsylvania, in Westmoreland co. It is on the Pennsylvania and the Ligonier Valley railroad, and on the Loyal Hanna Creek. It is surrounded by an extensive agricultural and coal and iron mining region. Its industries include the manufacture of coke ovens, steel mills, paper mills, flour mills, glass factories, etc. It is the seat of a monastery, hospital and convent. Pop. 1920, 9,484.

LATROBE, BENJAMIN HENRY (1763-1820), an American engineer, *b.* in England. He emigrated to the United States in 1795 and was for many years employed as an engineer by the State of Virginia. He was the architect of the United States Bank in Philadelphia and of the first Hall of Representatives, in Washington. He was the inventor of a famous and widely used stove and other household devices.

LATVIA, or **LETTONIA,** federal republic (56°-59° N., 21°-28° E.), comprising non-Bolshevik Livonia and Kurland (Courland), bounded N. by Esthonia, E. by N.W. Russia, S. by Lithuania, and W. by Baltic Sea. Surface generally plain, with marshy or sandy areas; chief riv. is Dvina, flowing into Gulf of Riga; over 1,000 lakes. Pine forests cover *c.* one-third of surface. Agriculture is the principal occupation; dairy farming and gardening are important; fisheries, especially in Lake Peïpus. There are textile, flour, paper, oil, and saw mills, distilleries, sugar refineries, leather and linseed industries. Commerce through Riga, Windau, and Libau is very considerable. The inhabitants are chiefly Letts. Until 1561, when they came under Swed. and Lithuanian-Polish rule, the Lettish countries were united; in 1721 Peter the Great gained Livonia from Sweden and made it a Russian province; in 1795 Kurland was united to Russia. Following the Russian revolution of 1917 these governments became republics. For war connection, see WORLD WAR. Area: Livonia, *c.* 17,600 sq. m.; Kurland, 10,435 sq. m.; total, 28,035 sq. m. Population: Livonia, *c.* 2,000,000; Kurland, 900,000; total, 2,900,000.

LAUCK, W(ILLIAM) JETT (1879), an American economist and statistician, *b.* in Keyser, W. Va. He graduated from the Washington and Lee University, in 1903, was professor of economics and political science there until 1907, when he took charge of an investigation of immigrant labor for the United States Immigration Commission. He was managing expert and statistician for the U.S. Commission on Industrial Relations during 1913-15, and since 1917 has been especially prominent as investigator of living costs for the Railroad brotherhoods. He has written *The Causes of the Panic of 1893*, 1905; *The Immigration Problem*, with Prof. Jeremiah W. Jenks, 1911, and *Strikes and Lockouts and Railway Labor Arbitration*, 1916.

LAUD, WILLIAM (1573-1645), Eng. abp.; ed. at Oxford; in 1611 made pres. of St. John's Coll. there, and dean of Gloucester, 1616, where he gave offense by removing the communion table to the east end; bp. of St. David's, 1621; and on accession of Charles I. did all in his power to crush the Puritan party; chancellor of Oxford Univ., 1629, where he did much good work for learning and discipline; abp. of Canterbury, 1633; supported absolutism of Charles I. in Church and State; impeached, 1640, and after being kept in prison executed. L. was a man with many good qualities, but narrow-minded and bent at all costs on maintaining outward uniformity (for pure theol. he cared not so much), and failed to understand the temper of his time.

LAUDANUM (*Tinctura opii*), preparation of opium in equal parts of alcohol and water, the proportion of opium being 1 in 13½ or 1 gr. in 15 minims, the usual dose being 5 to 15 minims for repeated, 20 to 30 minims for single, dose; is a valuable method of giving OPIUM.

LAUDER, SIR HARRY MACLENNAN (1870), Scot. vocalist and comedian; *b.* Portobello, near Edinburgh; mill boy in Arbroath flax mill; then miner; amateur vocalist; and subsequently made hit at London Pavilion; has frequently visited U.S. and has attained unprecedented success on music hall stage by dint of healthy sentiment and clean humor. During the World War proved himself an ardent patriot; in U.S. conducted unofficial Brit. propaganda; sang to troops in France (see *A Minstrel in France*, 1918), and inaugurated Harry Lauder Million Fund for relief of distressed ex-soldiers and dependents. Writes and composes his own songs. Knighted in 1919.

LAUDERDALE, JOHN MAITLAND, DUKE OF (1616-82), *b.* at Lethington; originally a Covenanter, subsequently became loyalist; taken prisoner at Worcester, 1651; app. Sec. of State by Charles II., 1660; maintained great influence over king; put down Covenanters; member of *Cabal* Ministry; duke, 1672; attacked by Commons and Scots, but retained position till 1680, when he resigned.

LAUENBURG (*c.* 53° 32′ N., 10° 40′ E.), former duchy, Schleswig-Holstein, Germany. After various vicissitudes, L. was ceded to Prussia and Austria by Denmark in 1864, Prussia obtaining complete possession in 1865. Area, 455 sq. miles. Pop. *c.* 56,000.

LAUGHING GAS (N_2O), nitrous oxide; see NITROGEN.

LAUGHING-JACKASS, or GREAT KINGFISHER, the popular name of the species of *Dacelo*, an Australian genus of coraciiform birds belonging to the family Alcedinidæ. They are so called because of their extraordinary gurgling note. *D. gigas*, the principal species, has brown plumage, with a white stripe on each side of the head. It nests in shady forest regions, but will also frequent the vicinity of houses. Its diet consists of insects, reptiles, molluscs, etc., and occasionally it will devour small mammals or birds.

LAUGHLIN, CLARA ELIZABETH (1873), an American author, *b.* at New York, daughter of Samuel Wilson and Elizabeth Abbott Laughlin. She graduated from the North Division High School, Chicago in 1890. Author: *Stories of Authors' Loves*, (2 vols.); 1902; *Divided*, 1904; *The Death of Lincoln*, 1909; *Just Folks*, 1910; *Everybody's Lonesome*, 1910; *Children of Tomorrow*, 1911; *The Penny Philanthropist*, 1912; *The Work-a-Day Girl*, 1913; *Everybody's Birthright*, 1914; *When My Ship Comes Home*, 1915; *Reminiscences of James Whitcomb Riley*, 1916; *The Heart of Her Highness*, 1917; *The Keys of Heaven*, also *Foch, The Man*, 1918 and *The Martyred Towns of France*, 1919.

LAUGHLIN, JAMES LAURENCE (1850), an American economist, *b.* in Deerfield, Ohio. He graduated from Harvard University, in 1873. He was professor and head of the department of political economy at the University of Chicago from 1892 to 1916, and professor emeritus since then. Since 1892 he has been editor of the Journal of Political Economy. Among his works are *A Study of Political Economy*, 1885; *A History of Bimetalism in the United States*, 1886; *Industrial America*, 1906; *Money and Prices*, 1919, and *Banking Progress*, 1920.

LAUGHTER, complex bodily expression which generally accompanies joy, mirth, and consciousness of anything comic, but may accompany other emotions when there is a sudden release from severe tension, and may be produced by tickling.

LAUNCESTON.—(1) (50° 48′ N.; 4° 21′ W.), town, Cornwall, England; remains of old walls and Augustinian priory; ruined castle, scene of several sieges during Civil War; here George Fox was immured, 1656. Pop. 5,000. (2) (41° 26′ S., 147° 7′ E.), town, Tasmania; commercial center. Pop. 20,000.

LAUNDRY, place for washing and 'getting up' clothes; processes include washing, boiling, rinsing, blueing, drying by hydro-extractors and dry air, starching, and ironing.

LA UNION.—(1) (13° 19′ N., 87° 49′ W.), port, Salvador, Central America. Pop. *c.* 5,000. (2) (37° 34′ N., 0° 50′ W.), town, Spain; iron mines. Pop. 35,000.

LAUREATE, a word used to signify eminent in one of the arts; the laurel in ancient times being associated with Apollo. Poet Laureate is the poet attached to the royal household.

LAUREL, or sweet bay (*Laurus nobilis*), an evergreen shrub indigenous to Mediterranean region, and commonly cultivated in Eng. gardens. The leaves, which are glossy and leathery in texture, contain hydrocyanic acid, causing a

characteristic smell of bitter almonds when crushed. The flowers are small and yellow, and produce purple berries which are used in veterinary med.

LAUREL, a city of Mississippi, in Jones co., of which it is the county seat. It is on the Mobile, Jackson and Kansas City, the Gulf and Ship Island, and the Queen and Crescent railroads. It is the center of an important commercial and manufacturing region. Its industries include cotton mills, railroad shops, wagon works, and lumber mills. The city has two parks, a city hall building and other public buildings. Pop. 1920, 13,037.

LAURENS, HENRY (1724-92), an American diplomat, *b.* in Charleston, S.C. He began his career as a clerk in a store, then became a merchant. He was a member of the first South Carolina provincial congress and in 1777 succeeded John Hancock as President of the Continental Congress. In 1779 he was sent to Holland on a diplomatic errand, was captured by the British and for 15 months imprisoned in the Tower of London, being finally exchanged for General Cornwallis. He, together with Adams, Franklin and Jay signed the preliminary peace treaty with Great Britain in Paris, on Nov. 30, 1782.

LAURENS, JOHN (1753-82), an American Revolutionary soldier, *b.* in South Carolina, and the son of Henry Laurens. He was educated in England. In 1777 he was an aide on the staff of Washington, also acting as the latter's private secretary, but later he commanded a brigade of infantry and participated in most of the battles where Washington was present. In 1881 he went on a successful mission to France to raise money for the cause of the Colonies. He was in command of troops at Yorktown and personally received the sword of Cornwallis at the surrender. He was finally killed in a skirmish on the Combahee River, in South Carolina.

LAURENTIAN SYSTEM, ARCHÆAN SYSTEM. See GEOLOGY.

LAURIA, LORIA (40° 1′ N., 15° 48′ E.), walled town, Italy. Pop. 11,000.

LAURIA, ROGER DE, LURIA, or **LORIA** (*d.* 1305), Span. admiral; on outbreak of Sicilian Vespers went to Sicily with Peter III. of Aragon, who app. him commander of fleet; defeated Anjevines, 1283, 1284; gained brilliant victories off Catalonian coast, 1285, routing French near Hormigas and at Rosas.

LAURIER, SIR WILFRID (1841-1919), Canadian statesman of Fr. extraction; *b.* St. Lin, Quebec; educated at L'Assomption Coll., and M'Gill Univ.; called to bar, 1864; entered Quebec Legislature, 1871; Dominion House of Commons, 1874; fine bilingual orator; minister of inland revenue in Mackenzie government, 1877; party defeated at polls in 1878, and in opposition eighteen years; leader of Liberal party, 1891; prime minister (first French-Canadian to hold the office), 1896; inaugurated British preferential tariff, 1897; devoted himself to development of resources of Canada, and to its prosperity as part of empire; returned to power in 1900, 1904, and 1908; defeated in 1911, mainly on question of reciprocity with U.S. Favored raising of Canadian Expeditionary Force by voluntary methods; refused to join coalition, which was overwhelmingly returned in 1917; continued to act as leader of opposition till death.

LAURIUM.—(1) (*c.* 37° 50′ N.; 23° 50′ E.), town, Greece; silver mines. Pop. 10,500.

LAURIUM, a village of Michigan, formerly known as Calumet. It is on the Mineral Range and Copper Range railroads. The village is the center of one of the largest and richest copper producing regions in the world, and its industries are connected with that of copper mining. Pop. 1920, 6,696.

LAURVIK (59° 4′ N., 10° 5′ E.), port, Norway; shipbuilding. Pop. 12,000.

LAUSANNE, town, cap. Vaud, Switzerland (46° 31′ N., 6° 38′ E.), on slopes of Jorat range; half a mile from Ouchy, its port on N. shore of Lake Geneva; two chief parts of city separated by valley, over which is fine bridge (617 ft. long, 82 ft. high), built 1844; seat of federal court of justice; imposing cathedral, 1235-75; univ., schools of agriculture and viticulture, etc.; on Simplon tunnel route between Paris and Milan; machinery, tobacco, and chocolate; vineyards in vicinity; here Gibbon wrote latter half of his *Decline and Fall*; see of R.C. bishop. Pop. 64,000. Here in 1923 a conference was held between representatives of Turkey and France, Great Britain and Italy for a settlement of the questions at issue between Greece and Turkey. See LAUSANNE, CONFERENCE OF.

LAUSANNE CONFERENCES, two conferences held at Lausanne, Switzerland, in 1922 and 1923, between the Allied Powers and Turkey. Their object was to settle questions in dispute between Turkey and Greece following the defeat of the latter in the Turko-Grecian war of 1922. The Allied Powers included France, Great Britain, Italy, Japan,

Jugo-Slavia, Rumania and Greece. Russia and Bulgaria were represented at a second conference relating to the straits. The United States was also represented by Richard Watson Child as an observer. The chief points brought forward by Turkey were the regulations in regard to the Dardanelles and the Bosporus; the possession of Constantinople; the abolition of the capitulations or special rights of foreigners in Turkey; the exchange of minority populations between Greece and Turkey; independence of the Arab States; the Bagdad railway; the cession of eastern Thrace to Greece; reparations; together with minor questions. After prolonged discussion Turkey received many of the concessions asked for, including the possession of Eastern Thrace and the practical possession of Asia Minor. The Allied Powers, however, refused to abolish the capitulations and Great Britain refused to return the territory of Mosul to Turkey. The question of Constantinople was left in abeyance. The Turkish delegation refused to sign the treaty and the first conference broke up. The Turkish Parliament supported the action of the delegates.

The second conference, which was an effort to further solve questions at issue, met at Lausanne in May, 1923. For the results of this conference, see TURKEY, *History*.

LAUSANNE, PEACE OF, see ITALY, *History*.

LAUT, AGNES C. (1871), an author, *b.* at Ontario, Can., grandfather was principal of Queen's University. She studied at Manitoba University but left in junior year because of ill health. She was an editorial writer for the Manitoba Free Press from 1895-7, after which she was correspondent for various Canadian, English and American newspapers and magazines in New York, including the Saturday Evening Post, Collier's, and Review of Reviews. Author: *Lords of the North*, 1900; *Freebooters of the Wilderness*, 1910; *New Dawn*, 1913; *Through Unknown Southwest*, 1913; *Adventures of England on Hudson Bay*, 1914; *Canadian Commonwealth*, 1915 and *Pioneers of the Pacific Coast*, 1915.

LAUTERBACH, EDWARD (1844-1923), an American lawyer, *b.* in New York City. He graduated from the College of the City of New York, in 1864 and at once began practice in New York City. He made a specialty of railway law and became identified with some of the largest financial and industrial institutions in the country. He took an active part in politics and several times served as delegate to the National Republican Convention. He was president of the Baltimore and Southern Railway and other railways. He took an active part in charitable work and was connected for many years with the Hebrew Orphan Asylum. He was recognized as one of the best known lawyers and public spirited citizens of New York.

LAUZUN, DUC DE, ANTONIN NOMPAR DE CAUMONT, MARQUIS DE PUYGIULHEM (1632-1723), Fr. courtier and soldier; favorite of Louis XIV.; imprisoned, 1671-81; subsequently went to England; commanded Brest expedition, 1689.

LAVA, the substance which is emitted in a liquid state from the crater of a volcano. Ls. are divided into different classes, the quality of the L. depending on the amount of silica which it contains. Those which are known as 'basic' contain less silica than the others, and consequently flow for much greater distances, as they take much longer to solidify. The exterior or crust of a stream of L. cools quickly when exposed to the air, and the molten L. which is underneath often breaks through this crust and continues its course, thus disturbing the evenness of the original surface and forming loose blocks of material.

LAVAGNA.—(1) (44° 18′ N., 9° 21′ E.), port, Liguria, Italy. Pop. 7400. (2) (45° 27′ N., 9° 26′ E.), town, Lombardy, Italy.

LAVAL (48° 4′ N., 0° 46′ W.), town, Mayenne, France; episcopal see; cathedral dates in part from XII. cent.; old ducal castle; formerly fortified. Manufactures textiles; marble quarries. Pop. 32,000.

LAVAL, JOHN M. (1854), bishop (auxiliary), *b.* at St. Etienne, Loire, France, *s.* of Francois and Catherine Crozet Laval. After studying at Mont Brison Little Seminary, France and at St. Michæl Jesuit College, St. Etienne, he came to the United States in 1872 and studied philosophy and theology at New Orleans. He was ordained a Roman Catholic priest in 1877 and after being pastor of various churches including St. Louis Cathedral, New Orleans, 1902-11, he was appointed auxiliary bishop of New Orleans and also vicar-gen. and pastor of Church of St. Vincent de Paul, 1911.

LAVAL UNIVERSITY, a Roman Catholic institution of higher learning, founded in Quebec, Canada, in 1852. It has a library of 140,000 volumes and one of the most complete cabinet of physics in America. In its theological

department alone it has a faculty of 60 the rest of the faculty numbering about 40. The student body averages 11,000.

LA VALLIÈRE, LOUISE FRANÇOISE DE (1644-1710), mistress of Louis XIV.; superseded by Mme. de Montespan; retired to Carmelite Convent, 1674.

LAVATER, JOHANN KASPAR (1741-1801), Ger. poet and writer on physiognomy; his great work on physiognomy (4 vols., 1775-78) occasioned much discussion, but was praised by Goethe.

LAVENDER (*Lavandula vera*), a member of the Labiatæ; of shrubby habit, with pale, bluish flowers possessing a characteristic and exquisite odor, and prolific in honey; blooms, on distillation, yield oil of l., which is used in perfumery and painting; often dried, and placed in packets for linen press, or used in making potpourri.

LAVIGERIE, CHARLES MARTIAL ALLEMAND (1825-92), Catholic prelate; abp. of Algiers, 1866, devoting himself to work among Mohammedans; supported papal infallibility; latterly reconciled to Fr. Republic.

LAVINIUM (41° 40′ N., 12° 28′ E.), ancient town, Latium, Italy; traditionally founded by Æneas, near site of Laurentum, with which it was united as Lauro-Lavinium, under Trajan; remains include necropolis. On site is modern Pratica.

LAVOISIER, ANTOINE LAURENT (1743-94), Fr. chemist; laid the foundations of quantitative chem. by use of balance; proved indestructibility of matter, and that water is not turned into earth by heating, but that heated sulphur, phosphorus, and tin gain by absorption of air; employed Priestley's discovery of oxygen, and Cavendish's of the compound nature of water to overthrow phlogiston theory, and establish true theory of combustion; showed nature of diamond, introduced system of chemical classification and nomenclature; served Fr. State as *Fermier-general* (tax collector); commissioner for gunpowder, and for weights and measures, and on Committee of Agriculture; executed by Revolutionists.

LA VOISIN, CATHERINE MONVOISIN (*d.* 1680), Fr. witch; concocted love powders, etc.; executed for complicity in plot to poison Louis XIV.

LAW. Two ideas may be said to be connoted by the term L.: (1) command, (2) order. The former is implicit in the body of the principles observed and acted upon by the state in the administration of justice. The school of analytical jurisprudence defines positive law as a command imposed upon an inferior by a superior. Modern thought regarding sovereignty, as inherent in the people and government as resting purely on consent, denies the validity of this definition, and perhaps the following definition by Professor Holland is more in accordance with fact: 'Law in general is the sum total of those general rules of action as are enforced by a sovereign political authority.' The continental jurists regard positive L. (*positus, i.e. settled* by man) as only a narrow species of L. proper, and when talking of L. in the abstract deviate into scientific conceptions of rights and justice, giving to morality a positive force disguised under the name of 'natural laws.' The connotation of order is uppermost in ancient nomology (Gk. law). Classical jurists and philosophers, observing an inevitable sequence in the operations of nature, referred that sequence to the will of some anthropomorphic deity then, later, when they abandoned the notion of a supreme lawgiver, to activities of a universe moving according to law. The earlier recognized no separation of varied phenomena into physics, theology, ethics, and jurisprudence, but deemed everything to be of divine contrivance; the later distinguished between sciences relating to external nature and those relating to human activities, but L. was the common term, denoting in the one the method of the phenomena of the universe, in the other the abstract idea of rules regulating the actions of mankind. See JURISPRUDENCE.

LAW, RT. HON. ANDREW BONAR (1858-1923), Brit. statesman; *b.* New Brunswick; formerly a member of two firms of iron merchants in Glasgow and chairman of Glasgow Iron Trade Association; he entered Parliament in 1900 as Unionist member for the Blackfriars Division of Glasgow; one of the leading protagonists of tariff reform; parliamentary secretary to the Board of Trade, 1902-6, rapidly made a party reputation, and was leader of the Opposition, 1911-15; P.C. 1911. On formation of first Coalition became secretary of state for the Colonies, 1915-16. In the first Lloyd George ministry he was chancellor of the Exchequer (introduced his first Budget on May 2, 1917,) and owing to the constant absence of the prime minister acted as leader of the House, 1916-18; also a member of the War Cabinet. Plenipotentiary to the Peace Conference, 1919. After the general election of Dec. 1918, at which the Coalition won an overwhelming victory, became lord privy seal and leader of the

House. Without any distinguished gift of speech is remarkable for fluency and persuasiveness. He headed the Conservation revolt from the coalition cabinet in 1922, and contributed largely to the victory of the Conservative party in October of that year. He became prime minister and head of the conservative government. He resigned, from illness, in 1923.

LAW, BABYLONIAN. See BABYLONIA.

LAW, CANON. See CANON LAW.

LAW, JOHN (1671-1729), financier; *b.* Edinburgh; led a wild youth; imprisoned for slaying his antagonist in a duel; went to Holland, and became interested in finance; served in France under the Regent, 1715, and propounded a vast scheme to get the country out of financial difficulties. A bank was formed, of which L. became director, and company was formed to do trade with the Indies. A tremendous boom resulted, during which too many shares were issued, prices rose, and a crash came, 1720, when L. became detested. He left France, and *d.* in poverty.

LAW OF CONSTANT PROPORTIONS. See CHEMISTRY.

LAW OF EQUIVALENT PROPORTIONS. See CHEMISTRY.

LAW OF MULTIPLE PROPORTIONS. See CHEMISTRY.

LAW, WILLIAM (1686-1761); Eng. theologian; taught in Cambridge, but refused to take oath to George I., becoming a 'non-juror'; author of the *Serious Call*, and other works from High Church standpoint; a notable mystic. Whyte, *Characters and Characteristics of William Law*, 1893.

LAWLER, JOHN J. (1862,) bishop, *b.* at Rochester, Minn. He was educated at the Seminary of St. Francis, Milwaukee and later studied philosophy and theology at the University of Louvain, Belgium. He was ordained a Roman Catholic priest in 1885 and remained at the university four years for postgraduate course, after which he was professor of scripture at the College of St. Thomas, St. Paul, for one year, then became pastor of St. Luke's Church and later of the Cathedral, St. Paul. He was appointed auxiliary bishop archdiocese of St. Paul in 1910 and bishop of Lead, S.D. in 1916.

LAWN-TENNIS, modern form of Tennis (*q.v.*), introduced *c.* 1875; played on grass or artificial courts, generally in open air, though play in winter is carried on in covered courts. Similar to tennis in mode of scoring, it is played with balls and racquets; balls must measure 2½ in. in diameter and weigh 1⅞ to 2 oz.; there are no standard measurements for racquets, which are oval in shape and vary from 13 to 17 oz. in weight according to wrist-strength of player. There are two varieties of the game, 'singles' for two, and 'doubles' for four players; in the first case the court is 78 ft. by 27 ft., with a serving-court 27 ft. in length on either side of the net; in the second the breadth is increased by 9 ft. while the serving-court remains the same. The net, which is stretched across the middle of the court is 3 ft. 6 in. at supporting-posts, and 3 ft. at center of court.

The 'server,' who opens play in each game, must deliver ball in opposite serving-court; two strokes are allowed; thereafter play within enclosing lines is open, and stroke is terminated when one side hits ball into net or outside the court. The service changes with every game. The fast overhand serve is nowadays the most popular form of service, and the higher the serve is, the faster the delivery.

LAWRENCE, a city of Kansas, in Douglas co., of which it is the county seat. It is on the Atchison, Topeka and Sante Fe, and the Union Pacific railroads, and on both sides of the Kansas river, 40 miles west of Kansas City. It is the commercial and industrial center for Douglas and parts of two other counties. It is an important industrial community and water power is furnished by the river. Its industries include flour and paper mills, barbed wire factories, ice, shirt, sash and door factories, and foundry and machine shop factories. Lawrence is the seat of Kansas State University, Haskell Institute, and Indian Industrial School. It has a hospital, public library and several parks. Pop. 1920, 12,456.

LAWRENCE, a city of Massachusetts, in Essex co., of which it is the county seat. It is on the Boston and Maine railroad and on both sides of the Merrimac river, 29 miles west of Boston. The river furnishes excellent water power for the important industries of the city. It is dammed by a solid granite wall, 900 feet long and 30 feet wide. Lawrence is one of the greatest cotton and woolen milling centers in the world and has also manufactures of foundry and machine shop products, stationery, carriages, sewing machines, boilers, hardware, boots and shoes, etc. The city has a public library, a court-house and other public buildings. It is connected by electric street railway with neighbor-

ing towns and cities. The charitable and educational institutions include a city hospital, Roman Catholic hospital, Essex County Truant School, and a high school. Pop. 1920, 94,270.

LAWRENCE, ABBOTT (1792-1855), Amer. diplomatist; acquired great wealth in business with his bro. Amos; several years member of Congress; minister to England, 1849.

LAWRENCE, AMOS ADAMS (1814-86), Amer. financier; founder of L. College, Appleton, Wisconsin, and of L. City, Kansas; opposed revolt of South.

LAWRENCE, DAVID (1888), an American newspaper man, *b.* at Philadelphia, Pa., *s.* of Harris and Dora Cohen Lawrence. Following his graduation from Princeton University in 1910 he became connected with the Associated Press and after covering the Madero and Orozco revolutions in Mexico, and being with President Woodrow Wilson at the White House for 2 years he was placed in charge, at the outbreak of the war, of news for the Associated Press relative to neutrality and relations with Germany. From 1916-19 he was Washington correspondent for the New York Evening Post and in 1919 became president of the Consolidated Press Association, Washington.

LAWRENCE, SIR HENRY MONTGOMERY (1806-57), Brit. soldier and politician; joined Bengal artillery, 1823; served in first Burmese War, 1824-26; first Afghan War, 1838; reduced Kaithal; established several military asylums in India; served in Sikh War, 1845-48; administrator in Punjab, 1849; fortified Lucknow in Mutiny; killed at beginning of siege.

LAWRENCE, JAMES (1781-1813), an American naval officer. He entered the Navy as a midshipman in 1798, served in the war with Tripoli, being one of the boarding party which captured the frigate Philadelphia, and in the year 1812 had command of the Hornet, with which he fought and captured the British brig Peacock in fifteen minutes. In 1813 he was given command of the frigate Chesapeake, lying in Boston Harbor, which was being blockaded by the British ship Shannon. On June 1 he sailed out of the harbor and gave the Shannon battle, the Chesapeake being compelled to surrender, but not until after Captain Lawrence had been fatally wounded. His last words, 'Don't give up the ship,' have become a classic in American school books.

LAWRENCE, JOHN LAIRD MAIR, 1ST BARON L. (1811-79), Eng. administrator; younger *s.* of Lieut.-Col. Alexander L., who served in Mysore campaign, 1790, and capture of Seringapatam, 1799, and younger bro. of Sir Henry L., hero of Lucknow; on annexation of Punjab, 1849, became commissioner, and subsequently lieut.-gov., and won devotion of untamable Sikhs; loyalty of Punjab proved salvation of British at outbreak of Mutiny; troops sent by L. relieved important garrisons; received annual pension of $5,000 as reward; baronet, 1858; P.C., 1859; Gov.-Gen. of India, 1863, and received annual pension of $10,000 from East India Company; baron, 1869.

LAWRENCE, ST., river, see ST. LAWRENCE.

LAWRENCE, SIR THOMAS (1769-1830), Eng. painter; became famous in boyhood; succeeded Reynolds as limner to the king, and had a greater vogue than any portrait painter of his time; pres., Royal Academy, 1820; among his famous portraits is *Countess of Derby.*

LAWRENCE, THOMAS EDWARD (1888), Eng. archæologist, linguist, and soldier; studied at Oxford; spent much time in the Near East, where he became intimately acquainted with the countries and their languages. On outbreak of World War was excavating Hittite ruins near Carchemish, in the valley of the Euphrates, but was immediately recalled to England on account of his Eastern knowledge, and given a commission in map department, 1914-16. After revolt of Arabs of the Hejaz against Turkey, 1916, he accompanied a Brit. mission to Hussein, Sherif of Mecca. He was soon appointed to the staff of Prince Feisal; undertook the organization of the Arab. army, and during the campaign won a reputation as a skillful and daring leader. He received the D.S.O. 1918; the Croix de Guerre with palms from France; and high honors from King Hussein.

LAWRENCE UNIVERSITY, educational institution at Appleton, Wisconsin, established in 1849 and named after one of its principal donors. It is coeducational, and is conducted under the auspices of the Methodist Episcopal Church. Besides the ordinary courses in arts, letters and science, it offers instruction in painting and music. In 1923 it had 1,242 students, 62 instructors and professors and an endowment fund of $1,821,755.

LAWRENCE, WILLIAM (1850), American Protestant Episcopal bishop; *b.* Boston, Mass. He graduated at

Harvard in 1871 and from the Episcopal Theological School at Cambridge in 1875. From 1876 to 1884 he was rector of Grace Church, Lawrence, Mass., and in the latter year became professor of homiletics and pastoral theology at the Cambridge Theological School, holding that position until 1893, when he was elected bishop of Massachusetts, succeeding Phillips Brooks. His publications include *Visions and Service*, 1896; *Life of Roger Wolcott*, 1902, and *Study of Phillips Brooks*, 1903.

LAWS, AGRARIAN. See AGRARIAN LAWS.

LAWS, BLUE SKY. See BLUE SKY LAWS.

LAWS, CORN. See CORN LAWS.

LAWSON, ERNEST, landscape artist. He exhibited in leading cities of the United States and is represented in the permanent collections of the principal art galleries. Some of the awards he received are: silver medal, St. Louis Exposition, 1904; Sesnan medal, Pa. Academy, 1907; First Halgarten prize, 1908; Innis gold medal, 1917, and 1st Altman landscape prize, 1921, N.A.D. Also gold medal San Francisco Expn., 1915; Corcoran silver medal, Washington, 1916; Temple gold medal, Pa. Acad., 1920, and first prize, Carnegie Inst., Pittsburgh, 1921, A.N.A.

LAWSON, JOHN DAVISON (1852), university dean, *b.* at Hamilton, Can., *s.* of Joseph and Charlotte Davison Lawson. He was educated at Osgoode Hall. After practicing law in St. Louis for 9 years he was judge of Civil Courts from 1886-91 and then professor of contract and international law, 1891-1903, and dean of the School of Law, 1903-16, of the University of Mo. He was also editor of the Central Law Journal, St. Louis for 5 years, editor of the American Law Review, and president of the Missouri Bar Association during 1904-5. Author: *Cases on Quasi Contracts*, 1907, and others.

LAWSON, VICTOR FREMONT (1850), an Amer. editor and publisher, *b.* at Chicago, *s.* of Iver and Melinda H. Lawson. He was educated at Phillips Academy, Andover, Mass. After having had an interest in a printing establishment, he bought the Chicago Daily News in 1876 and in conjunction with a partner developed a successful paper. He however took over his partner's interest in 1888 and became the sole proprietor. He was also at one time the president and afterwards a director of the Associated Press and in addition to establishing the Daily News Fresh Air Fund did a great deal towards the establishment of the Postal Savings Bank in America.

LAWSON, SIR WILFRID, Bart. (1829-1906), Brit. politician; M.P., 1859; introduced Permissive Bill concerning sale of intoxicating liquors, 1864; opposed Boer War; pres. of United Kingdom Alliance; had reputation as wit.

LAWTON, a city of Oklahoma, in Comanche co., of which it is the county seat. It is on the St. Louis and San Francisco and the Chicago, Rock Island and Pacific railroads. It is the trade center for an extensive farming and cotton raising district. Within the city is Fort Sill, an army post, and it is also the seat of Fort Sill Indian School, the Wichita National Forest and Game Preserve. It has a public park and several handsome public buildings. Pop. 1920, 8,930.

LAWTON, HENRY WARE (1843-99), major-general; *b.* Manhattan, Ohio; *d.* Luzon, P.I. He entered the army as a private in 1861 to engage in the Civil War, where he achieved such distinction that he rose from sergeant to brevet colonel. After the war he was commissioned as second lieutenant in the 41st Infantry on the recommendation of Generals Sherman and Sheridan. He took a brilliant part in the Cuba operations of the Spanish-American war of 1898 becoming colonel of the regular army and brigadier-general of volunteers, then major-general. After the war, as second in command to General Otis in the campaign to quell the Philippine insurrection, he was killed in 1899 at San Mateo while making an offensive against entrenched Filipinos with the object of capturing Aguinaldo.

LAYAMON, Eng. poet of XII. cent., was a priest at Emley on the Severn. His *Brut* (British History), a work founded on the writings of Bede, 'St. Albin,' 'Austin,' and Wace, is of great importance prosodically as transition between O.E. and Eng. prosody; lines with O.E. alliteration and trochaic cadence alternate with iambic rhyming lines.

LAYARD, SIR AUSTEN HENRY (1817-94), Brit. archæologist and politician; *b.* Paris; conducted important excavations at Nimrud in 1845; pub. *Nineveh and its Remains* and *Monuments of Nineveh*. Became M.P. for Aylesbury, 1852, and later Chief Commissioner of Works.

LAY BROTHERS. See BROTHERHOODS.

LAZARETTO: (1) A lazar-house or hospital for lepers, dedicated to St Lazarus. These houses existed through-

out Europe in the middle ages, and were established not solely for lepers but for the sick poor. Since about the 14th century, leprosy has been steadily declining in Europe and is found only in limited districts, in Norway, Iceland, Russia, and a few other countries. Modern leper-hospitals exist at Bergen, Norway, Tracadie, New Brunswick, Robben Is., Cape Town, and several are in India. (2) A place for the performance of quarantine, established for the reception of goods or passengers or crew of a ship suspected of certain infectious diseases, such as yellow fever, plague, or cholera.

LAZARISTS, VINCENTIANS, 'Congregation of Priests of the Mission,' R.C. Order, founded at St. Lazare, Paris, by St. Vincent de Paul for teaching of lower classes, 1624; now number *c.* 3,000.

LAZARUS.—(1) In *John* 11^{12}, raised by Christ from the dead; (2) in *Luke* 16^{20}, in parable of Dives and Lazarus.

LAZULITE. See LAPIS, LAZULI.

LEA, HENRY CHARLES (1825-1909), American author; *b.* Philadelphia, Pa. He entered his father's publishing house in 1843 and retired from business in 1880. He was an omnivorous reader and devoted a great deal of his time to research, amassing a fund of material from which subsequent writers have drawn. His publications include *A History of the Inquisition of The Middle Ages*, 1888; *Chapters from the Religious History of Spain*, 1890; *A History Auricular Confession and Indulgences in the Latin Church*, 1896; and *The Inquisition in the Spanish Dependencies*, 1908.

LEACOCK, STEPHEN BUTLER (1869), head of dep. of political economy, M'Gill Univ., Montreal, and humorist; has worked a rich vein in *Literary Lapses*, 1910; *Nonsense Novels*, 1911; *Sunshine Sketches of a Little Town*, 1912; *Behind and Beyond*, 1913; *Arcadian Adventures with the Idle Rich*, 1914; *Moonbeams from the Larger Lunacy*, 1915; *Further Foolishness*, 1916; *Frenzied Fiction*, 1917; *The Hohenzollerns in America*, 1919.

LEAD, one of the most useful metallic elements, known from the earliest times. The chief ore from which it is extracted is galena, which contains about 86 per cent of lead, often associated with zinc and silver. Lead ores are found almost everywhere in the world, especially in the United States (the leading lead producer), Spain, Germany, Great Britain and Australia. Lead mines were worked in biblical times in Egypt and Palestine. The Romans used lead for water pipes, water tanks and for other purposes. Lead is more proof against atmospheric and soil influences than most other metals. Malleable to a high degree, but less ductile, it has a very limited tenacity, is easily cut, can be readily scratched, and its bluish-white color has a bright lustre when newly cut or melted.

The smelting operation of extracting the metal from the galena ore is simple and usually performed by the blast furnace, which receives the ore in small pieces or crushed to powder, and the impurities the molten metal retains after it flows from the furnace are eliminated by refining processes. The crude lead contains antimony, iron, arsenic and other metals; also gold and silver. The former are oxidizable by air; desilverization and the recovery of gold are effected by other methods, sometimes electrolytic. The commercial product is chiefly known as soft lead, desilverized lead or hard lead. Soft and desilverized lead are the most familiar, being daily seen in lead pipe and plumbing. These grades are also largely used as linings in chemical plants and for vessels, being proof against the action of acids and other corrosive elements. Hard lead is utilized for printing equipment, such as type and stereotype forms.

The chief American lead states are Missouri, Idaho, Utah and Oklahoma. There are great smelting plants in these states as well as in Colorado and Montana. The main supply comes from the Rocky Mountain regions. In 1921 the American output of refined lead amounted to 398,222 short tons valued at $35,840,000. In 1919 there were 432 enterprises devoted to lead and zinc production and they had an output worth $75,579,347. Oklahoma led with 111, Missouri had 93, and Idaho 20 plants. Other states, including Nevada, California, Arizona, and Wisconsin mine and smelt lead in lesser quantities.

LEAD, a city of Lawrence co., S. Dakota. Has one of the largest gold mines in the world, and carries on manuf. of gold jewelry. Pop. 1920, 5,013.

LEAD ARSENATE. $Pb_3(AsO_4)_2$, sometimes known as gypsine because it was used to exterminate the caterpillar of the gypsy moth. Occurs as white crystals or as a paste. An exceedingly poisonous compound widely used in solution for spraying trees and plants to destroy insects and caterpillars, for which purpose it is often mixed with lime or sulphur. It is preferred to other poisons because it causes very little leaf scorching. It is prepared by adding a solution containing 7 oz. of lead acetate to a solution containing 2 oz. of dry, or $3\frac{1}{2}$ oz. of crystallized, sodium arsenate.

For use as a spray, the mixture is diluted to ten gallons. Lead nitrate may be used in place of the acetate, the resulting compound then having the formula $Pb_2 H_2 (AsO_4)_2$.

LEAD POISONING, or **PLUMBISM**, a form of poisoning due to the introduction of lead into the system. It is a 'disease of occupations' and specially affects workers in potteries where lead glaze is used, as well as painters, plumbers, glazfers, printers, and others. In such cases the disease is the result of minute doses of lead being absorbed over a long period of time. The symptoms vary with the extent of the poisoning and also with the constitution of the individual. A common form is painter's colic, which is attended with frequent intestinal pains and obstinate constipation. The poison proceeds to produce anæmia, wasting, muscular tremors, and ultimate paralysis. Among characteristic signs are the blue line on the gums, and the presence of 'wrist-drop,' in which the hands become useless and the joints deformed. A test for lead in the system is provided by painting a small area of the skin with a 6 per cent. solution of lead sulphite; if lead be present, the area will darken in a few days. The treatment in acute cases consists of the administration of potassium iodide. The absorption of lead can, however, be avoided altogether by strict attention to cleanliness, particularly with respect to the hands and nails.

LEADVILLE, a city of Colorado, in Lake co., of which it is the county seat. It is on the Atchison, Topeka and Sante Fe, the Denver and Rio Grande, and the Colorado Midland railroads, 80 miles southwest of Denver. Leadville is one of the most famous mining localities in the world. Here were discovered and mined gold and silver ore to the value of millions of dollars. Its importance declined but was again revived through the application of processes to use low grade ore. It is also the mining and farming center of an extensive region. Its public buildings include a courthouse, jail, almshouse, etc. Pop. about 5,000.

LEAF, in botany, is a term applied to various lateral outgrowths of the stem, (*e.g.*) bracts, sepals, and petals, all of which are considered under their individual headings, but in its best known sense it is applied to those members of the plant which constitute its foliage. The foliage L. consists typically of three parts, the *lamina* or leaf-blade, *petiole* or leaf-stalk, and *vagina* or leaf-base. The vagina frequently bears two lateral outgrowths known as *stipules*, (*e.g.*) rose; when vagina and petiole are absent, as is often the case, the L. is said to be *sessile*, (*e.g.*) honeysuckle. The shape of the lamina varies very greatly, but the different forms are divided sharply into two as *compound* or *simple*, the former indicating that the lamina is split up into a number of distinct parts called leaflets, while the latter indicates that however much the blade may be indented it is not split up into leaflets. The venation of L's. is necessarily related to their form: in the typical L. of a Monocotyledon, (*e.g.*) iris, the veins run parallel to one another, and the L. is long and undivided, while in a Dictyledon the venation is always reticulate and the L. may be greatly divided, (*e.g.*) horse-chestnut. The same plant may bear several types of L's., and one which grows with part of its foliage in a submerged condition will be noticed to have its aquatic L's. very finely divided to withstand the force of the water. The functions performed by L's. are of the greatest importance to the life of the parent plant. Most of the carbon dioxide absorbed from the atmosphere is taken in by the L's.; respiration or the exchange of carbon dioxide for oxygen is also effected by them, as well as transpiration or the giving off of large quantities of surplus water.

LEAF INSECTS AND STICK INSECTS (*Phasmidoe*), a family of Orthoptera, with about 600 species, which have bodies, limbs, and wing-covers (where present) resembling bare twigs or leaves. They subsist upon leaves and are nocturnal in habit. Tropical and subtropical, especially Australian, but four or five kinds have been found in Europe.

LEAGUE OF NATIONS. The first influential proposal for a comprehensive League of Nations came from King George of Bohemia, who in 1460 advocated the establishment of a league to secure permanent peace among the Christian states. Owing largely to difficulties connected with the position of the Pope the scheme failed, and little more was done until the end of the 16th cent., when Henry IV. of France originated his Grand Dessein. To the Grand Dessein can be traced the inception, not only of the idea of the modern League of Nations, but also of International Law itself. The proposals of Henry IV. were being developed in a promising manner when the king met an untimely fate. After the defeat of Napoleon at Waterloo, the Holy Alliance was formed between the Czar of Russia, the King of Prussia, and the Emperor of Austria.

LEAGUE OF NATIONS

Based on the shifting sands of royal despotism and designed to suppress the liberty of peoples, it enjoyed a very short existence.

In 1915 the American League to Enforce Peace urged that the United States should join a League of Nations whose members would submit all international disputes for peaceful settlement and would utilize their economic and military forces against any member who committed an act of hostility against any other member without first submitting the matter at issue to peaceful settlement. This lead was quickly followed in other countries, when voluntary societies were founded to advocate the establishment of a League of Nations. The principal societies in the United Kingdom were the League of Nations Society and the League of Free Nations Association, afterwards amalgamated under the title of the League of Nations Union. The successful establishment of the League of Nations was largely due to educational work of these societies. In Jan. 1918 President Wilson issued his fourteen points, which included provision for a League of Nations. At the end of the year General Smuts pub. a pamphlet with detailed proposals, which were largely adopted as the basis of the Covenant of the League of Nations. The Covenant was drawn up at the Peace Conference in Paris, and was unanimously accepted by the representatives of the Allied and Associated Powers on April 28, 1919. It formed an integral part of all the peace treaties.

The principal provisions of the Covenant include the following: The functions of the League are discharged by a Council and an Assembly. The former consists of representatives of the British Empire, France, Italy, Japan, and of four other states selected by the Assembly. These numbers may be increased. The Council may deal with any matter within the sphere of action of the League or affecting the peace of the world. It first met in Paris on January 16, 1920. The Assembly is composed of not more than three representatives of each member of the League. Its first meeting was held November 15, 1920, at Geneva. Each member has one vote. Any matter within the sphere of action of the League or affecting the peace of the world may be dealt with by the Assembly. Except where otherwise provided, decisions of the Assembly or Council must be unanimous. Article 8 states that the members of the League recognize that the maintenance of peace requires the reduction of national armaments to the lowest point consistent with national safety and the enforcement by common action of international obligations. Plans for such reduction and proposals for restricting private manufacture of munitions will be formulated by the Council for the consideration and action of the several governments. The members of the League undertake to interchange full and frank information as to the scale of their armaments, their naval and military programs, and the condition of such of their industries as are adaptable to warlike purposes. The territorial integrity and existing political independence of all members will be respected and preserved by the League as a whole. Any war or threat of war is declared a matter of concern to the League, which will take action to safeguard peace. Disputes between members which are likely to lead to a rupture must be submitted to inquiry by the Council or to arbitration, and the members agree that resort shall not be had to war until three months after the report of the Council or the award of the arbitrators.

Plans were formulated for a permanent Court of International Justice. If the Council came to a unanimous decision on a dispute submitted to them, the members agree not to go to war with any party to the dispute which complies with the Council's recommendations. Either party or the Council may refer the matter to the Assembly. The Council will not interfere in a question which by international law is solely within the domestic jurisdiction of a member. If any member resorts to war in defiance of the above provisions, an economic blockade will be enforced by all the other members, and the Council will recommend what armed forces shall be provided by each member to protect the covenants of the League. If one or more of the parties to a dispute are not members, they may be made members for the purposes of the dispute. If they decline membership, the Council may take such measures as will prevent hostilities. All treaties entered into by a member are to be made public. The Council may advise the reconsideration of obsolete treaties. The Monroe doctrine is upheld. Mandates for the well-being and development of countries not yet able to stand by themselves will be exercised on behalf of the League by the more advanced nations. Several provisions deal with conditions of labor, traffic in women, children, dangerous drugs and arms, communications and transit, and prevention and control of disease. All future international bureaus and commissions will be placed under the direction of the League, together with the existing bureaus where the parties consent. The League has already brought about the establishment of International Labor and Health Bur-

eaus. The following were the original members of the League: Belgium, Bolivia, Brazil, British Empire, Canada, Australia, South Africa, New Zealand, India, China (not yet ratified), Cuba (not yet ratified), Czecho-Slovakia, Ecuador (not yet ratified), France, Greece Guatemala, Haiti, Hejaz, Honduras (not yet ratified), Italy, Japan, Liberia, Nicaragua (not yet ratified), Panama, Peru, Poland, Portugal, Rumania, Jugo-Slavia, Siam, Uruguay.

At the beginning of 1923, 52 nations had become members of the League. These included every important country except Germany, Turkey and the United States. Germany had expressed a desire to join, as had also Turkey, but action on their admission had been deferred. The United States Senate had refused to ratify the League Covenant of the treaty. See UNITED STATES, *History*.

The first meeting of the League Assembly was held at Geneva from Nov. 15 to Dec. 18, 1920. 41 states were represented. Paul Hymans of Belgium was chosen president. Spain, Brazil, Belgium and China were elected to the four non-permanent places in the council. The chief work accomplished at the first assembly was the adoption of a plan for a permanent court of international justice, and an international health organization was also established, with a program looking to the suppression of the traffic in women and children. Steps were also taken for the better control of the opium traffic, and resolutions were passed looking for the control of traffic in arms. Members of the League were invited to limit their annual expenditures on armaments to sums not exceeding those of the previous two years. The second League Assembly was held at Geneva from September 5 to October 6, 1921. Its permanent president was J. Van Karnebek, of Holland. The first members of the Court of International Justice were chosen, John Bassett Moore being selected from the United States. Further action was taken for the suppression of the white slave and opium traffic, and a number of international disputes were acted upon, including those in Albania, Silesia and Vilna. The Assembly defined Article 10 of the League Covenant by declaring that it did not constitute a pledge on the part of any nation to send military forces to preserve the territorial integrity of any other nation. The Article was defined merely as a declaration of principle.

The third assembly met at Geneva, September 4, 1922. Its most notable work was the successful carrying out of a plan for the rehabilitation of Austria by granting a loan to that country. The Assembly adopted unanimously the principle of a reduction of armaments, based upon a treaty of mutual guarantee against attack. Hungary was admitted to membership, leaving only Germany and Turkey of the former enemy powers outside the League. An important change was made in the membership of the Council. It was originally planned that the great powers should dominate that body with five members and that all the other powers should be entitled to only four. As the United States failed to ratify and became a member of the League, the proportion became 4 and 4. The great powers provided, therefore, for the entrance into the council of two small powers, so that the proportion should stand 4 great powers and 6 lesser powers. The six non-permanent members chosen were Brazil, Spain, Uruguay, Belgium, Sweden and China. The chief accomplishments of the League have been the settlement of the disputes between Germany and Poland and Silesia; the dispute in regard to the Aland islands; the disputes in relation to Albania; and as noted above, the granting of a loan to Austria. The League made no effort to participate in the negotiations protecting the controversies between Turkey and Greece in 1922-3, or between Italy and Greece in 1923. The president of the third assembly was M. Augustin Edwards of Chile.

LEAMINGTON PRIORS, or ROYAL LEAMINGTON SPA, a municipal bor. and health resort of Warwickshire, England, on R. Leam, 2½ m. from Warwick. The mineral springs (saline, sulphurous, and chaly-beate), discovered 1874, are much frequented. Cooking-ranges are extensively manufactured. Pop. 1921, 28,946.

LEANDER. See HERO AND LEANDER.

LEAP YEAR, also known as 'bissextile,' the name given to every year which has 366 days. In 46 B.C. the calendar was reformed by Julius Cæsar. The solar year was settled at 365¼ days, and under the new arrangement the February of every fourth year was to have 29 days instead of 28, the calendar thus taking a leap of one day every fourth year to balance its being six hours too short in each ordinary year. A leap year is divisible by four without a remainder, excepting in the case of concluding years of centuries, when every fourth year only is a leap year. See CALENDAR.

LEAR, EDWARD (1812-88), Eng. artist and writer; exhibited at the Royal

Academy from 1850 to 1873, and wrote several illustrated books; best known for his *Book of Nonsense*, 1846.

LEASE, agreement between landlord and tenant, which must be in writing, must begin on a certain date, and be either for a term of years or for lives. Leases contain covenants to do or forbear undertaken by lessee, usually the following: (1) to pay rent; (2) to pay rates and taxes: (3) to make repairs; (4) to insure; (5) not to assign or sublet, etc.

LEATHER, the skin of an animal converted by a variety of processes into a durable material with an infinity of useful purposes. It thus enters into many industries, its employment being dictated by the fundamental character of the skin of the animal it represents, according to its fibre, texture and grain, coarseness or fineness, whether it is stout or thin, flexible or otherwise. Cowhide and pigskin are used for traveling grips; heavy boots are also made of the former, and saddles and fancy leather goods of the latter. Sheepskin appears in shoe linings and gloves. Patent and japanned leather is generally calfskin. Goatskins constitute morocco leather. Alligator, crocodile, seal and walrus skins are also utilized in making many serviceable articles. Even fish skins have their commercial uses, such as those of the porpoise and shark. Novelty goods, including card cases, belts and pocketbooks, frequently are made of frog and snake skins. Cordovan, made from horsehide, and almost waterproof, is also used as leather.

The animal's hide has an outer epidermis that is hard and horny and an under tissue containing the perspiratory and sebaceous glands. The true skin lies between, and is made up of gelatinous fibres. With the removal of the outer layers, the inner skin is subjected to the application of various substances whose combination with the gelatin produces a material that becomes durable, penetrable and flexible. For this purpose tannic acid (tanning) is used, or chromium salts. The treatment embraces tanning, or the use of mineral salts, largely those of alumina, and chamoising, or the blending of the leather with oily or fatty substances.

The industry embraces the production of tanned, curried and finished leather, the latter including belting and hose, boots and shoes, gloves and mittens, saddlery and harness, trunks and valises, pocketbooks and numerous other manufactures. In the United States millions of hides and skins are used taken from cattle, calves, sheep and lambs, and in a less degree from goats, kids, horses, colts and other animals. The industry in 1919, as reported by the Census Bureau, had 680 establishments, capitalized at $671,341,553, and produced tanned, curried and finished leather valued at $928,591,701.

LEAVEN (through Fr. *levain*; from Lat. *levamen*, solace, *levare*, to lift up), a substance which produces fermentation; also an underlying element or influence which produces a subtle change over anything. To the Hebrew the word suggested corruption, hence leavened bread was not permitted in sacrifices. At the Feast of the Passover or of Massôth unleavened bread was eaten. In the N.T. the Kingdom of Heaven is compared to L. (Matt. xiii. 33), signifying a good influence. The idea of corruption is suggested in the reference to the L. of the Pharisees in Matt. xvi. 6.

LEAVENWORTH, a city of Kansas, in Leavenworth co. It is on the Atchison, Topeka and Sante Fe, the Burlington Route, the Chicago, Rock Island and Pacific, and other railroads, and on the Missouri river, 26 miles N.W. of Kansas City. Leavenworth is a large trade center for an extensive farming and mining region. Its industries include the manufacture of flour, syrup, glucose, stoves, machinery, boots and shoes, iron bridges, furniture, etc. Its institutions include Mount St. Mary's Academy, Cushing and St. John's hospitals, Kansas State Orphan Asylum, Whittier Library, and State and Federal penitentiaries. Adjoining the city on the north is Fort Leavenworth, where is an infantry and cavalry school and a National cemetery. Pop. 1920, 16,912.

LEBANON, a city of Indiana, in Boone co., of which it is the county seat. It is on the Cleveland, Cincinnati, Chicago and St. Louis, and the Central Indiana railroads. Its industries include saw mills, chair factories, a condensed-milk factory, grain elevators, etc. Pop. 1920, 6,257.

LEBANON, a city of Pennsylvania, in Lebanon co., of which it is the county seat. It is on the Philadelphia and Reading, the Cornwall and Lebanon, and other railroads. In the neighborhood are important deposits of brownstone, limestone, brick and clay. There are also large iron mines in the neighborhood. The chief industries are iron mining, quarrying, brick making and the manufacture of silk, nuts and bolts, boilers. etc. There is a public library, a court-house and other public buildings. Pop. 1920, 24,643.

LEBANON, MOUNT (*Libanus*, the White Mountain), a mountain chain of Syria and Palestine, parallel with the

Mediterranean coast with spurs projecting to the sea, the Jebel-Libuan or Jebel-el Gharbi of the Arabs. It stretches from the Nahr-el-Kebir, near Tripoli, and Homs to the Litany (ancient *Leontes*), near Tyre, and the range is continued by the hills of Palestine, the biblical mountains of Naphtali, Ephraim, and Judea. To the E. is the Anti-Libanus range (Jebel-esh-Sharki), with El-Buka'a (ancient *Coele-Syria*), a narrow, fertile valley between. The average height of Lebanon is 7000 ft., its chief peaks, Dahr-el-Kodib and Jebel-Makmal, being about 10,000 ft. The formation is limestone, sandstone, and basalt. Only a few groves of the once noted cedars now remain. Sheep and goats are reared, and much silk is produced from the silk-worms of the mulberry plantations. Iron, coal, asphalt, and amber are found. The inhabitants are mostly Christians (Maronites and Greek Catholics), but a few Druses remain in the S. Since 1861, a Christian governor, under protection of the European powers, has been appointed. His seat is at Beit-ed-din in summer, at Baabda in winter. Pop. 260,000 to 400,000.

LEBANON VALLEY COLLEGE, co-educational institution located at Annville, Pa. It was founded in 1867 and is under the auspices of the United Brethren Church. There are five courses that lead to the degree of A.B. besides a preparatory department and schools in art, oratory and music. The grounds and buildings are valued at more than $300,000. In 1923 the college had an enrollment of 303 students and there were 21 members of the faculty.

LE BRUN, CHARLES (1619-90), Fr. painter; patronized by Louis XIV., who employed him for the decoration of the palace of Versailles.

LE CATEAU formerly Cateau-Cambrêsis, manufacturing tn., Nord, France (50° 4′ N., 3° 22′ E.), 16 m. E.S.E. of Cambrai; arose around ancient palace of Archbishop of Cambrai; textiles; sugar refining, brewing, metal-founding, and mosaic work. Marshal Mortier was a native; treaty signed here between England, France, and Spain, 1559. Pop. 10,200. It figured importantly in the early and closing days of the World War.

First Battle.—See MONS, *Retreat from.*

Second Battle.—Le Cateau again became a center of war interest in the early days of Oct. 1918, when the Germans were in retreat and were pressing President Wilson to conclude an immediate armistice. On the 8th Haig struck between Sequehart and the S. of Cambrai with the 3rd and 4th Armies, Debeney continuing the line to the neighborhood of St. Quentin. Early on the morning of the 9th Cambrai fell. The third day of the battle (10th) saw the approach to the Selle R. completed, but thereafter the resistance stiffened and the battle of the Selle River followed. Le Cateau was entered on the 10th of Oct. See WAR, THE WORLD.

LECCE.—(1) (40° 22′ N., 18° 9′ E.), town, L. province, Apulia, Italy; seat of abp.; cathedral; formerly fortified. Pop. 37,000. (2) (41° 55′ N., 13° 41′ E.), town, Abruzzi, Italy.

LECKY, WILLIAM EDWARD HARTPOLE (1838-1903), Irish historian and man of letters; pub. anonymously *Leaders of Public Opinion in Ireland*, 1861; became Unionist M.P. for Dublin Univ., also P.C. 1897; chief work, *History of England in the Eighteenth Century*, 1878-90; wrote also *History of Rationalism in Europe*, 1865; *Democracy and Liberty*, new ed. 1899; *The Map of Life*, new ed. 1901.

LE CLERC, JEAN (1657-1736), Fr. Prot. theologian; preached at Saumur and at London; prof. at Amsterdam, 1684-1712; wrote various works on Biblical criticism, in advance of his time.

LECONTE DE LISLE, CHARLES MARIE (1818-94), a French poet, born in the island of Réunion. He settled in Paris in 1846. His first work, *La Venus de Milo*, 1848, gained him many friends, especially among the devotees of classical literature, and he produced his *Poems Antiques*, which contain some of his best work, in 1852. These were followed by *Poems et Poesies*, 1854; *Le Chemin de la Croix*, 1859; *Poems Barbares*, 1862; *Les Erinnyes*, a tragedy after the Greek model, 1872; *Poems Tragiques*, 1884; and *L'Apollonide*, 1888. Besides this, he translated Theocritus, Anacreon, the *Iliad* and *Odyssey*, Hesiod, Æschylus, Horace, Sophocles, and Euripides. *Derniers Poems* appeared posthumously, 1899. His poems had a great influence on the young poets of his time, and are marked by classic regularity and faultlessness of form. He was made assistant librarian at the Luxembourg in 1873, and succeeded to Victor Hugo's chair at the Academy in 1886.

LE CONTE, JOSEPH (1823-1901), American educator and geologist; *b.* Liberty co., Georgia. He graduated at Franklin College in that State in 1841, and four years later at the College of Physicians and Surgeons, New York City. Later he studied at Harvard, 1851, and while there formed a lifelong friendship with Louis Agassiz. He taught geology and natural history at Franklin College, 1852-56; held the chair

of geology and chemistry at South Carolina College, 1857-69, and was professor of geology and natural history at the University of California, 1869-1901, His publications include *Religion and Science*, 1873; *Elements of Geology*, 1878; *Evolution: Its Nature, Its Evidences and Its Relations to Religious Thought*, 1887.

LECOUVREUR, ADRIENNE (1692-1730), famous Fr. tragic actress.

LE CREUSOT (46° 48′ N., 4° 25′ E.), town, Saône-et-Loire, France; coal, iron. Pop. 36,000.

LECTIONARY (Latin *lectio*, 'reading') term applied to a volume, particularly of Scripture, arranged for reading selected passages; also to the list or system of passages to be read: thus the l. of Scripture for the Anglican Church is printed at the beginning of the Prayer Book.

LEDA, in Greek myth, a daughter of Thestius and Eurythemis, and wife of Tyndareus, King of Sparta. Zeus visited L. in the form of a swan, and by him she became the mother of Castor and Pollux. The story is recounted by Homer, Hesiod, Ovid, Euripides, and other of the ancient writers.

LEDOUX, ALBERT REID (1852), an American mining engineer, *b.* at Newport, Ky., *s.* of Rev. Louis P. and Katherine C. Reid Ledoux. He was educated at the Columbia School of Mines and also at the University of Berlin and the University of Gottingen. He began in 1880 and afterwards practiced as a consulting engineer, metallurgist, assayer and chemist and was an expert in chemistry and engineering cases, in addition to which he was vice president of the Assurance Co. of America, consulting engineer of the American Bureau of Mines and vice president of the Chapultepec Land Co.

LEDOUX, LOUIS VERNON (1880), an American author, *b.* at New York, son of Albert Reid and Annie Van Vorst Powers Ledoux. He graduated from Columbia University in 1902 and took a postgraduate course the following year. He was vice president of Ledoux & Co., mining engineers and metallurgists. Author; *Songs from the Silent Land*, 1905; *The Soul's Progress and Other Poems*, 1907; *Yzdra*, 1909 and revised edition, 1917; *The Shadow of Etna*, 1914; *The Story of Eleusis*, 1916 and *George Edward Woodberry—A Study of His Poetry*, 1917.

LEDRU-ROLLIN, ALEXANDRE AUGUSTE (1807-74), Fr. politician and writer; agitated for democratic revolution and became minister of Interior in provisional government, 1848; in exile, 1849-70; pub. *Decadence de l'Angleterre*, 1850.

LEDYARD, JOHN (1751-89), Amer. explorer; served under Captain Cook, 1776; walked across Europe and Asia, 1787.

LEE, ALBERT (1868), an American editor and publisher, *b.* at New Orleans, *s.* of Albert Lindley Lee. After graduating from Yale University in 1891 he was on the staff of the New York Sun for 4 years and later was engaged in various editorial capacities on several leading magazines including McClure's Magazine, Harper's Weekly and Collier's Weekly and from 1915-19 was managing editor of Vanity Fair after which he was manager of the foreign editions of Vogue. Author: *Tommy Toddles*, 1896; *The Knave of Hearts*, 1897; *He, She and They*, 1899 and *Pie and the Pirate*, 1909 also the plays *The Dutch Daisy* and *Miss Phoenix*.

LEE, ALGERNON (1873), American journalist and politician; *b.* Dubuque, Iowa. He was educated at the University of Iowa and since 1895 has been actively identified with the Socialist party. He edited Socialist papers from 1898 to 1909 and since that date has been educational director of the Rand School of Social Science. He was elected to the New York Board of Aldermen in 1917. He has been a delegate to three International Socialist Conferences 1904, 1907, 1916.

LEE, ANN (1736-84), English visionary and founder of the American Society of Shakers; *b.* Manchester, England. She was the daughter of a blacksmith and very illiterate. She organized open-air religious meetings in Manchester in 1770, and this led to her imprisonment on the charge of Sabbath breaking. During her confinement in prison she claimed to have had visions of Christ and a disclosure regarding His second coming, in addition to other alleged revelations which were afterward incorporated in the Shaker doctrine. She soon had many followers, by whom she was styled 'Mother Ann.' In 1774 she emigrated to America and founded the first American Shaker Settlement at Niskenna, now Watervliet, N.Y. The society was organized on a communistic basis having as its fundamental principles 'virginal purity, confession of sin, Christian communism and separation from the world.' Since 1787 the central home of the organization has been Mt. Lebanon, N.Y.

LEE, ARTHUR (1740-92), Amer. diplomat; member of Commission to

arrange treaty with France, 1776; Commissioner to Spain, 1777; opposed constitution.

LEE, CHARLES (1731-82), English soldier who served in the American Revolutionary army; *b.* Dernhall, England. He entered the English army in 1751; served in the French and Indian war in America; later, as a soldier of fortune, did brilliant work under the flags of Portugal and Poland. He came to America in 1773, and at the outbreak of the Revolutionary war offered his services to the patriot cause and was made a major-general in the Continental Army. He assisted in the defense of Charleston and received the thanks of Congress. In December of 1776 while serving with Washington in New Jersey he was captured by the British, and while in captivity revealed the plans of Washington to Sir William Howe. Later he was exchanged, and as the Revolutionary authorities were not cognizant of his perfidy, was again placed in a position of command. At the battle of Monmouth in 1778, he disobeyed Washington's orders and nearly brought about a disastrous defeat. A court-martial suspended him for a year, and later, because of his insolence to Congress, he was discharged from the service.

LEE, FITZHUGH (1835-1905), American soldier and executive; *b.* Clermont, Va. He graduated at the United States Military Academy in 1856, and, entering the army, greatly distinguished himself in several Indian campaigns on the Texas frontier. When the Civil War broke out he entered the Confederate service in the cavalry army and speedily became known as one of the most dashing and resourceful leaders. He did conspicuous and brilliant work at Antietam, Chancellorsville, in the Shenandoah and in the final battles before Richmond. In 1886 he was elected governor of Virginia, serving until 1890. He was made consul-general to Cuba in 1896, and rendered important services to the government prior to the breaking out of the war with Spain. He served as major-general of volunteers during the Spanish American war, and later was made military governor of the province of Havana. His publications include *Robert E. Lee*, 1894, and *Cuba's Struggle Against Spain*, 1899.

LEE, FRANCIS LIGHTFOOT (1737-97), American statesman and signer of the Declaration of Independence; *b.* Stratford, Virginia. He was educated by private tutors, served in the Virginia House of Burgesses, 1765-75, and was chosen a delegate to the Continental Congress, 1775-79. He was an ardent patriot and not only signed the Declaration but later helped to draw up the Articles of Confederation. He rendered conspicuous public services in the matters in dispute between America and Great Britain concerning the Newfoundland Fisheries and the navigation of the Mississippi.

LEE, GERALD STANLEY (1862), American author and clergyman; *b.* Brockton, Mass. He graduated in 1885 from Middlebury College and three years later from Yale Divinity School. He entered the Congregational ministry and held pastorates at Princeton, Minn., Sharon, Conn. and West Springfield, Mass. for the ensuing nine years. He has lectured widely throughout the country. His publications include *The Shadow Christ*, 1896; *Inspired Millionaires*, 1908; *The Lonely Nation*, 1917; *The Air-Line to Liberty*, 1918; *The Ghost in the White House*, 1920; *Invisible Exercise*, 1921, and *Seven Studies in Self-Command*, 1921.

LEE, HENRY (1756-1818), American soldier; *b.* Leesylvania, Va. He graduated at Princeton in 1773; entered the Continental army in 1777 and rendered notable services at Valley Forge, in recognition of which he was raised to the rank of major, 1778. He commanded a cavalry force, and the lightning-like celerity of his movements that puzzled and bewildered the enemy earned him the name of 'Light-horse Harry.' He received the thanks of Congress for his brilliant work at Paulus Hook, 1779. Later he served in the South under Greene, and won from him the encomium that 'no man in the progress of that campaign had equal merit.' After the struggle was concluded, he identified himself with the Federalist party and represented that party in Congress, 1799-1801. It was he who first referred to Washington as 'first in war, first in peace and first in the hearts of his countrymen.'

LEE, JENNETTE (BARBOUR PERRY) (1860), American educator and author; *b.* Bristol, Conn. She graduated at Smith College in 1886. She taught English literature at Vassar, 1890-93; held a similar chair in the College for Women at Western Reserve University, 1893-96, and at Smith College, 1901-13. Her publications include *The Son of a Fiddler*, 1902; *Simeon Tetlow's Shadow*, 1909; *The Taste of Apples*, 1913; *The Woman in the Alcove*, 1914; *The Green Jacket*, 1917; *The Raincoat Girl*, 1919, and *The Other Susan*, 1921.

LEE, NATHANIEL (*c.* 1653-92), an English writer of drama. He produced

his first play, *Nero, Emperor of Rome*, in 1675. *Sophronisba* and *Gloriana* were published in 1676, but he made his reputation by *The Rival Queens*, a blank verse tragedy in 1677. Many others followed, his last being *Constantine the Great*, 1684. L. also collaborated with Dryden in *Oedipus*, 1679; and *The Duke of Guise*, 1682.

LEE, RICHARD HENRY (1732-94), American statesman; *b.* Stratford, Va. He received his education in England and returned to his native State in 1752. He served as a member of the Virginia House of Burgesses, 1761-88. An ardent patriot, he took an active part in events leading up to the American Revolution. From 1774 till 1780 he was a member of the Continental Congress, and was the author of that part of the Declaration of Independence which read: 'These united Colonies are and of right ought to be free and independent states, and all political connection between them and the state of Great Britain is and ought to be totally dissolved.' He opposed the ratification of the Federal Constitution, but later modified his views and supported the administration of Washington. He was a member of the United States senate, 1789-92, and was the author of the Tenth Amendment to the Constitution.

LEE, ROBERT EDWARD (1807-70), American soldier. Born in Stratford, Westmoreland co., Virginia; *d.* in Lexington, Va. The son of General Henry Lee who was known in the Revolution as 'Light Horse Harry.' He graduated from West Point in 1829 second in his class. In June 1831 he married Mary Randolph Custis a great-granddaughter of Washington's wife. Assigned to the engineer corps he was stationed at Hampton Roads, 1829-34, assistant to the chief engineer U.S.A. at Washington, 1834-37: in charge of the work of improving the Mississippi river at St. Louis 1837-41. Promoted captain 1838 military charge of Fort Hamilton, New York Harbor, 1841-46. In 1846-47 during the Mexican war he was on General Scott's staff and fought with distinction in all battles from Vera Cruz to Mexico City. He was promoted major at Cerro Gordo, lieut.-colonel, and then colonel, after Chapultepec. In 1849-1852 he was engaged in construction work at Fort Carroll; superintendent of West Point 1852-56: and in 1860 in command of the Department of Texas. In 1859 while on leave of absence at Arlington he commanded the U.S. troops who captured John Brown at Harper's Ferry. After Texas seceded he was recalled to Washington. His position when the Civil War began was a difficult one. A slave holder he believed that slavery was an evil, but that eventually it would be done away without resort to arms. Above all he resented outside interference and disliked Abolitionists. He loved the Union, but honor demanded that he remain faithful to his state. In April 1861 Lincoln offered him command of the army of invasion which he declined and a few days later sent in his resignation. On April 22 he assumed command of the troops of Virginia and May 25 was appointed brigadier-general in the Confederate Army. He had confidential relations with Jefferson Davis and advised him in military matters. He personally led Confederate troops in the mountains which are now a part of West Virginia, but accomplished little because of poor subordinates. In 1862 Davis appointed him to direct all the Confederate armies. At Richmond he was successful in operations against McClellan and after General J.E. Johnston was wounded at Seven Pines he took command, on June 1, 1862, of the Northern Army of Virginia which he continued to lead throughout the war. In a seven days battle, June-July 1862, he checked McClellan's operations at Richmond and August 29-30 defeated Pope in the second battle of Bull's Run. Invading Maryland he was halted at Antietam September 16-17, and forced across the Potomac by McClellan. Taking up a strong position on the hills by Fredericksburg he shattered Burnside's attacks May 3-4, 1863. At Chancellorsville he defeated Hooker, and with the arrival of fresh troops began the invasion of Pennsylvania, planning to conquer the Army of the Potomac, capture Washington, and so end the war. But Meade defeated him at Gettysburg and he was forced back into Virginia. The campaigns against Grant, 1864-65 wore down the Confederate armies, while the Union troops were constantly reinforced. He finally surrendered at Appomattox Court House on April 9, 1865. He was appointed President of Washington College, Lexington, Virginia, in August 1865, and held the office until his death. General Lee left an imperishable name as one of the greatest soldiers of the Civil War, if not one of the greatest in military history.

LEE, SIR SIDNEY (1859), Eng. man of letters; ed. of *Dictionary of National Biography*, 1891; prof. of Eng. language and literature, univ. of London, 1913; works include *Life of Shakespeare*, 1898, *Life of Queen Victoria*, 1902; *Elizabethan Sonnets*, 1904; *French Renaissance in England*, 1910; *Shakespeare and the Italian Renaissance*, 1915, etc.

LEE, STEPHEN DILL (1833-1908). American soldier; *b.* Charleston, S.C. He graduated at the United States Military Academy in 1854, and served at various posts in the West until the outbreak of the Civil War, when he resigned from the army and entered the Confederate service. He showed marked military qualities and rose from the rank of captain to that of lieutenant general. He won distinction at the battles of Seven Pines and at the second battle of Bull Run, as well as in the campaign against Pope and the Seven Days Battles around Richmond. At the close of the war he settled in Columbus, Miss. He was elected to the State senate in 1870, and in 1880 was chosen president of the State Agricultural and Mechanical College, holding that position until 1899.

LEE, WILLIAM L. (1866), a bishop, *b.* near Canton, Madison County, Miss., He was largely self educated but held the degree D.D. from Livingstone College, Salisbury, N.C. He was licensed to preach in A.M.E. Zion Church in 1889, became a deacon in 1893 and an elder in 1895 and after being pastor of various churches in North Carolina, South Carolina and Mississippi, he was pastor at Pittsburgh, Pa., from 1908-14 and at Brooklyn, N.Y. from then until 1916 and was elected a bishop May 16, 1916.

LEECH, JOHN (1817-64), Eng. caricaturist; fellow-pupil with Thackeray at Charterhouse; studied med.; contributed to *Punch*, with which his name is inseparably connected.

LEECHES, HIRUNDINEA or **DISCOPHORA**, a class of segmented worms, with long flattened bodies usually without setæ but bearing a sucker for adhesion at each end of the body. A few live in the sea, (*e.g.*) the Skate-Sucker or Rock-Leech (*Pontobdella*), but most in fresh water, as the Medicinal Leech (*Hirudo*) used in blood-letting, or on land, as the pestilent Land-Leeches (*Haemadispa*) of tropical countries.

LEEDS (53° 48′ N., 1° 32′ W.), town, Yorkshire, England; seat of univ. (founded, 1904); R.C. episcopal see; has annual musical festival; great center of woolen manufacture in England, and probably greatest woolen cloth mart in world; other manufactures are leather, boots, engines, machinery, chemicals, paper, silk. Connected by canal with Liverpool. L. is parliamentary borough, returning five M.P.'s. In vicinity are remains of Kirkstall Abbey. Pop. 1921, 458,320.

LEEDS, THOMAS OSBORNE, 1ST DUKE OF (1631-1712), Brit. statesman; also known as Earl of Danby; M.P., 1665; supported Buckingham; became treasurer of navy, 1668; P.C. and Lord Treasurer, 1673; opposed to Roman Catholics, dissenters, and religious toleration; supported Test Act, 1673; cr. Earl of Danby, 1674; introduced Test Oath, 1675; ended war with Holland, 1674; arranged marriage of William of Orange and Mary, dau. of James II., 1677; opposed to Fr. influence in Eng.; raised money for Fr. war, 1678; impeached, 1678, for intrigue and corruption; found guilty, but was pardoned; subsequently attainted, and imprisoned five years in Tower; released, 1684. Soon after accession of James II., joined opposition against king; was one of Revolution leaders; attached himself to William of Orange; became pres. of council, 1689; attained chief power when Halifax retired, 1690; again impeached for bribery, 1695, but proceedings fell through; subsequently retired, 1699.

LEEK (53° 7′ N., 2° 2′ W.), town, Staffordshire, England; remains of Cistercian abbey in neighborhood. Manufactures silk. Pop. 17,000.

LEEK (*Allium porrum*), a bulbous, liliaceous plant with strap-shaped, strongly smelling leaves; used as flavoring in broth. The l., as the Welsh national emblem, is said to owe its origin to St. David, who caused the Britons to wear distinguishing l. leaves in their hats when fighting the Saxons; hence the custom of wearing l. on St. David's Day.

LEEUWARDEN (53° 12′ N., 5° 47′ E.), town, Holland; commercial center; shipbuilding, iron, copper and lead works; has royal palace and museum. Pop. 40,000.

LEEUWENHOEK, ANTON VAN, LEUWENHOEK (1632-1723), Dutch optician; at first a maker of lenses for microscopes, became microscopist and naturalist; discovered the capillary circulation of the blood, the finer structures of teeth, hair, and epidermis, and made many observations on the structures of insects, crustaceans, and plants.

LEEWARD ISLANDS (20° N.; 75° W.), islands, W. Indies; Santa Cruz, St. John, and St. Thomas are Danish, the remaining islands British; they produce sugar, cotton, sulphur, cacao, lime citrate, and phosphates; area, 701 sq. miles. Pop. 130,000.

LEFEBVRE, PIERRE FRANÇOIS (1755-1820), Fr. marshal; fought in Revolutionary and Napoleonic Wars.

LEFEBVRE-DESNOËTTES, CHARLES, COMTE (1773-1822), Fr. soldier; served in Revolutionary and Napoleonic Wars.

LEFEVRE, EDWIN (1871), an author, *b.* at Colon, Columbia, s. of Henry L. (American) and Emilia (de la Ossa) Lefevre. He was educated in public schools at San Francisco and the Michigan Military Academy after which he studied mining engineering at Lehigh University. He was engaged in journalism from 1890, contributed to various magazines and was the author of: *Wall Street Stories*, 1901; *The Golden Flood*, 1905; *Sampson Rock of Wall Street*, 1907; *H.R.*, 1915; *The Plunderers*, 1916; *To The Last Penny*, 1917 and *Simonetta*, 1919.

LEG, the lower limb, or, more strictly anatomically, that part of the lower limb between the knee and the ankle. Its bony framework consists of two bones, the tibia and the fibula, the former of which may be felt immediately below the skin on the inner and anterior aspect of the l., while the latter is to the outer side of the tibia, articulating with it at its extremities. To the bones are attached numerous muscles, all of which are concerned in locomotion and the movements of the foot, the most prominent being those forming the projection of the calf. The anterior and posterior tibial arteries, the continuations of the popliteal and femoral artery, nourish the anterior and posterior parts of the l., while the nerve supply comes from the branches of the great sciatic nerve. The common *Potti's fracture* consists of fracture of the fibula about 3 in. from the end, with outward displacement of the foot, while sometimes the tibia may also be broken, just above the ankle-joint. *Bow-leg*, with exaggeration of the curve of the tibia, is a condition due to rickets. Ulceration of the l. is usually due to varicose veins diminishing the nutrition of the part.

LEGACY, a personal gift by will, and as such it is not to be paid before the claims of creditors are satisfied. In Rom. law a legacy was an injunction on the heir to disburse a certain sum to a third person.

LE GALLIENNE, EVA (1899), an actress, *b.* at London, England, daughter of Richard and Julie Norregaard Le Gallienne. She was educated at College Sevigné, Paris, France. She made her debut in the Prince of Wales Theatre, London in the *Laughter of Fools*, in 1915 and the following year made her American debut in New York in *The Melody of Youth*, and afterwards appeared in New York and en tour in *Mc Lazarus*, season of 1916-17, later, with Ethel Barrymore in *The Off Chance*, 1917-18, in *Not so Long Ago*, 1920-21 and *Liliom*, 1921-22.

LE GALLIENNE, RICHARD (1866), Eng. author and journalist; settled in U.S. 1898. His works include *The Life Romantic*, 1900; *An Old Country House*, 1902; *Painted Shadow*, 1904; *Romances of Old France*, 1905; *Little Dinners with the Sphinx*, 1909.

LEGATE (Lat. *legatus*, ambassador, etc.), name of representative of pope. Three ranks: (1) *legatus a latere* (*i.e.* from side of pope), usually cardinal; (2) *legatus natus*, whose position is inherent in archbishopric or other national ecclesiastical dignity; (3) *legatus missus* or apostolic *nuncio* or *internuncio*. *Ablegates* are sent abroad by pope on special missions. Power of local jurisdiction abolished by Council of Trent, 1545.

LEG-BOW (*Genu varum*), a deformity in which there is bending outwards and somewhat forwards of the legs, so that the distance between the knees is abnormally great. Most frequently due to rickets, but may be owing to the bones bending in the direction in which they are habitually placed before the child is able to walk. Natural straightening often occurs in young growing children; otherwise the child should be kept off its feet and treated for rickets. In older children an operation may be necessary to correct the deformity.

LEGEND (Fr. *legende*; Lat. *legenda*, from *legere*, to read), originally the term applied to a narrative of a religious kind in the early days of Christianity, and hence used for portions of scripture and lives of the saints as read in public worship. The word later came to be applied to a story, without any foundation in history, but popularly supposed to be true, handed down from one generation to another. These L's. were at first brief and simple, but gradually developed into long and imaginative tales of a more and more exaggerated description, so that by degrees the word came to mean a narrative, professedly historical, but in reality only traditional. The famous *Golden Legend*, a mediæval collection of the lives of the saints, was composed towards the end of the 13th century by Jacobus de Voraigne. The word L. is also used in connection with coats of arms and shields, and by numismatists for inscriptions or mottoes on coins or medals.

LEGENDRE, ADRIEN MARIE (1752-1833), Fr. mathematician; *b.* Paris;

app. prof. of Math's at Paris Military School, 1774; helped to measure degree of latitude and introduce decimal system; made important researches on elliptic functions, and was first to suggest method of least squares for determination of orbits of comets, 1806; Wrote *Exercices de Calcul Integral*; *Theorie des Nombres*; *Elements de Geometrie*; *Memoirs on Attractions of Ellipsoids*.

LEGERDEMAIN. See CONJURING.

LEGHORN (43° 33′ N., 10° 18′ E.), fortified seaport, Tuscany, Italy; fine harbor, extensive coasting and foreign trade; exports wine, oil, fruits, hides, straw hats. Episcopal see, fine cathedral. Owes importance to Medici family, under whom became free port, continuing such till 1868. Pop. 140,000.

LEGION, division of Rom. army; constitution under Republic; ten cohorts of infantry with 300 cavalry, comprising 4200 to 6000 men; cohorts arranged in two lines till time of Cæsar, who rearranged in three lines.

LEGION, AMERICAN. See AMERICAN LEGION.

LEGION OF HONOR, Fr. order of merit, created in 1802 by Napoleon for specially recognizing exploits and services both military and civil. Consists of Knights Grands Croix, Grands Officers, Commandeurs, Officiers, and Chevaliers, latter being unlimited. Head of the republic is grand chancellor of the order. Decoration is five double-rayed star with oak and laurel wreath.

LEGISLATION, AGRICULTURAL. See AGRICULTURAL LEGISLATION.

LEGISLATION FOR CHILDREN. See CHILD LABOR.

LEGISLATURES, the law-making authority of a country, or state. Legislatures are of modern origin. The ancient Greeks and Romans legislated by popular assemblies and not through special representatives elected, or appointed. England was the first to have representatives, chosen, first, the freeholders in the 13th century of the boroughs and the clergy. In France in 1302 the people were represented by the three estates, nobility, clergy and commons, who met and consulted with the king. This ceased in 1614 until the Revolution. The representative system in Europe in the 18th century was not of the whole people, but of certain classes. Eventually all bodies in the United States and abroad formed two chambers. Pennsylvania, Georgia and Vermont had at first single legislative chambers, and in recent years in Oregon, Nebraska, and California strong movements were made for a single chamber. Its advocates claim that it would save expense and hasten legislation, and that the veto power, referendum, etc., would serve to control unwise legislation of a single chamber. In the United States members of the upper and lower house are apportioned on the basis of the entire population, or number of voters. The usual rule that every county shall have a representative, or senator, works wrong as to equality. In New York no county can have more than a third of all representatives. This is to limit New York City. Only Illinois elects minority representatives to the lower house (1870), thus enabling Prohibitionists, Socialists, etc., to elect representatives. The upper house is the senate in all states. The majority of senators are elected for 4 years, the others for 2. The lower house is mostly called 'House of Representatives' and a few 'Assemblies' and 'House of Delegates.' All are paid salaries, or per diem allowances. Largest, Illinois $3500. Smallest South Carolina and New Hampshire $200. Per diem averages $4 to $5. Mileage 10 to 25 cents. In some states pay is fixed by the constitution, in others by the legislature. The majority of sessions are held every two years; New York, New Jersey, Georgia, and South Carolina every year, and Alabama every four years. See Reinsch *American Legislatures and Legislative Methods*, N.Y. 1907.

LEGITIMACY AND LEGITIMATION can only be acquired according to Amer. and Eng. law by birth in lawful wedlock. It is presumed that the child of a married woman is legitimate unless rebutting evidence of fact is produced. In many countries the legitimation of a child born before wedlock is effected by subsequent marriage of parents. Various laws were passed in England and other countries, after the World War, providing for the care of illegitimate children and their mothers.

LEGITIMISTS, party founded in 1830 to further Bourbon cause; efforts hindered by the tactlessness of leader, Comte de Chambord (*d.* 1883), present head Duc d'Orleans.

LEGNAGO (45° 11′ N., 11° 27′ E.), fortified town, Venetia, Italy. Pop. (commune) 18,000.

LEGNANO (45° 36′ N., 8° 54′ E.); town, Lombardy, Italy. Pop. *c.* 19,000.

LEGROS, ALPHONSE (1837-1911), Fr. painter and etcher; Slade prof. of Fine Arts at Univ. Coll., London, 1876-93; excelled in Fr. rural scenes and humble characters.

LEGUMINOSÆ, important family of dicotyledonous plants numbering over 12,000; has seed vessel of one carpel with seeds along one side and splitting open down the two edges; fruit known as *legume* is seen typically in common pea; has three sub-orders, two almost completely tropical, represented by Mimosa, Acacia, Tamarindus. The third sub-family is very common in Britain; includes Clover (*Trifolium*), Vetches (*Vicia*), Furzes (*Ulex*), Pea (*pisum*), Bean (*Vicia Faba*), Laburnum (*Cytisus laburnum*), and Broom (*Sarothamnus*).

LÈGYA (*c.* 21° N., 98° 10′ E.), one of Shan States, Burma, India. Pop. *c.* 27,500.

LEHIGH RIVER, stream in Pennsylvania, which rises near the southern extremity of Wayne county, flows in a southeasterly direction from Mauch Chunk to Allentown and thence runs northeasterly to Easton, where it joins the Delaware. Its length is about 120 miles. It traverses a rich anthracite country, and is notable for its picturesqueness and beauty.

LEHIGH UNIVERSITY, educational institution at South Bethlehem, Pa., founded in 1860 through the munificence of Asa Packer. The University has a magnificent campus on which are twenty buildings, one of them, the library, containing 140,000 volumes. Eight technical courses are offered to students in addition to the courses in arts and science. These are civil engineering, mechanical engineering, metallurgical engineering, electrometallurgy, mining engineering, electrical engineering, chemical engineering and chemistry. In 1923 the University had an enrollment of 1,132 students and a faculty of 102 members. Its endowment was $3,000,000.

LEHIGHTON, a borough of Pennsylvania, in Carbon co. It is on the Lehigh Valley and the Central of New Jersey railroads, and the Lehigh Coal and Navigation Canal. Its industries include the manufacture of silk and lace, meat packing establishments, a shirt factory, car shops, stone works, etc. There are two parks. Pop. 1920, 6,102.

LEHMANN, FREDERICK WILLIAM (1853), American lawyer; *b.* in Prussia. He came to this country at an early age and graduated at Tabor College, Iowa, in 1873. In the same year he was admitted to the bar, and practiced at Nebraska City, Neb. (1873-76), Des Moines, Iowa (1876-90) and since 1890 in St. Louis, Mo. He was appointed solicitor general of the United States in 1910, serving two years. He was U.S. delegate to the A.B.C. Mediation Conference at Niagara Falls in 1914. He was president of the American Bar Association in 1908-09.

LEIBNITZ, GOTTFRIED WILHELM (1646-1716), Ger. scholar and thinker; *b.* at Leipzig; entered univ. there, 1661. As a boy he had studied classics, as a student, philosophy, then math's and law, early showing his genius. He became acquainted with the Elector of Mainz and became interested in politics, suggesting a Fr. expedition to Egypt. Meanwhile he became busy with math's and mechanical science, and speculated in theol. and law. He invented a calculating machine and discovered the differential and integral calculus. In 1676 he entered the service of the Duke (afterwards Elector) of Hanover. L. formed schemes for uniting Catholicism and Protestantism, and this failing, tried to unite Lutherans and Calvinists. He continued his studies in many fields, especially economics, politics, and history. He collected hist. sources and began a history of Brunswick. Most of his philosophical work was done after 1690. In 1690 he pub. his *Essais de Theodicee sur la bonte de Dieu la liberte de l'homme et l'origine du mal*, the greatest of his philosophical works, and in 1714 *La Monadalogie* and *Principes de la nature et de la grace*; latterly, he devoted much time to correspondence.

LEICESTER (52° 39′ N., 1° 8′ W.), town, Leicestershire, England, on site of Rom. *Ratae*, of which traces remain; castle dates from Norman times. Trinity and Wyggeston's Hospitals from 1330 and 1513 respectively; ruined abbey; several fine old churches. Returns two M.P's. Important hosiery, boot, and lace industries. Pop. 1921, 237,700.

LEICESTER, EARLDOM OF. — There was a Saxon earldom of Mercia, with which the connection of any post-Conquest earldom of L. is conjectural. Title was held by Beaumonts, 1130-1204, Montforts, 1207-65, Plantagenets from 1265 till 1399, when it was merged in Crown by accession of Henry IV.; it was granted to Dudley, courtier of Queen Elizabeth in 1564, but lapsed at his death without issue in 1588; held by Sydneys, 1618-1743, by Thomas Coke, 1744-59, and by Townshends, 1784-1855. Another earldom, of L. of Holkham, has been held by Coke family since 1837.

LEICESTER, ROBERT DUDLEY, EARL OF (*c.* 1531-88), favorite of Queen Elizabeth. Early became courtier; Master of Horse on Elizabeth's accession; soon rose in her favor; m. Amy Robsart; suspected of compassing her

death, 1560, so as to marry Elizabeth; cr. Earl of L., 1564; secretly m. Lady Essex; commanded expedition to Low Countries, 1585; became gov.; lieut.-gen. of forces to resist Spaniards, 1588.

LEICESTERSHIRE (52° 40′ N., 1° 10′ W.), inland county, England; area, *c.* 823 sq. miles. L. came under domination of the Danes in X. cent.; was held by Lancastrians during Wars of Roses; in Civil War of Charles I.'s reign most of county supported Roundheads; surface undulating, rising to *c.* 900 ft. in N.W.; drained by Soar, Wreak; produces coal, iron, limestone, fireclay, pipeclay; sheep and cattle raised; manufactures hosiery, boots, agricultural implements Stilton cheese. Returns four M.P's. Pop. 1921, 494,522.

LEIDEN, LEYDEN (52° 10′ N., 4° 30′ E.), town, Holland; besieged by Spaniards, 1574; has famous univ., established 1575, and associated with Grotius, Descartes, Vossius, Arminius, Heinsius, and other scholars; magnificent library, museums of art, antiquities, natural history, and ethnography. Manufactures cloth, cotton; connected with Amsterdam and Rotterdam by canal. Pop. 65,000.

LEIDY, JOSEPH (1823-91), an Amer. naturalist, *b.* in Philadelphia. He served on the faculty of the University of Pennsylvania from 1845, and in 1884 was appointed director of the department of biology. In the same year he served as president of the Academy of Natural Sciences. He published over 800 papers on biological subjects.

LEIF ERICSSON, Greenland explorer; *s.* of Icelandic immigrant, Eric the Red; in return voyage from Norway to Greenland, in year 1000, cast on coast of N. America, which he named *Vinland* (*q.v.*).

LEIGH (53° 59′ N., 2° 31′ W.), town, Lancashire, England; silk, cotton. Pop. 1921, 45,545.

LEIGHTON, FREDERICK LEIGHTON, LORD (1830-96), Eng. painter; spent his early years in a series of extensive tours on the Continent, where he had instruction from some of the most distinguished artists, In 1855 he appeared at the Royal Academy with his famous picture, *Cimabue's Madonna carried in Procession through the Streets of Florence*, subsequently bought by Queen Victoria; elected Pres. of the Academy and knighted, 1878; sculptor also.

LEIGHTON, ROBERT (1611-84), Scot. scholar; studied at Edinburgh Univ.; spent some years abroad; principal of Edinburgh Univ., 1653; a learned pious, and unworldly man, was chosen one of bp's by Charles II., 1661, and did all he could to check persecution and bring about religious union; app. abp. of Glasgow, 1670, but alienated extreme Episcopalians and Presbyterians alike, resigning in despair, 1674.

LEINSTER (*c.* 53° N., 7° W.), province, Ireland. Area, 7618 sq. miles. Pop. 1,175,000.

LEIPZIG, city, Saxony, Germany (51° 20′ N., 12° 23′ E.); on fertile plain at junction of Elster, Pleisse, and Parde, 95 m. S.S.W. of Berlin. Leipzig dates back to 11th cent.; suffered severely during Thirty and Seven Years' Wars; at battle of Leipzig (1631) Gustavus Adolphus defeated Tilly; at battle of the Nations (1813) Allies defeated Napoleon; the seat of Supreme Court of German Empire since 1879; birthplace of Wagner. The anc. town (now business section, with narrow crooked streets and quaint houses) is separated from extensive suburbs by fine promenades, built on site of old fortifications. Notable buildings include Nikolaikirche (1170), Thomaskirche (1213), celebrated univ. (founded 1409), with extensive library, splendid Imperial Supreme Court, museums, municipal theater (1868). Auerbach's Keller (immortalized in Goethe's *Faust*), Gewandhaus (fine concert hall), and famous Royal Conservatory of Music. Leipzig ranks among first cities in the world in bookselling, publishing, typefounding, and music trades; seat of world-famous Teubner class. press; also metal and textile industries, chemicals, scientific instruments, leather, rubber, food-stuffs, etc.; famous fairs held Easter, Michaelmas, and New Year since Middle Ages. Pop. 587,600.

LEIRIA (39° 43′ N., 8° 47′ W.), cathedral town, Portugal; seat of bishopric. Pop. 5000. L. district has area of 1318 sq. miles. Pop. *c.* 240,000.

LEISLER, JACOB (*c.* 1635-91), Amer. political leader; led poorer classes, New York, during Eng. Revolution; lieut.-gov., New York, 1689-91; executed.

LEITH (55° 58′ N., 3° 10′ W.), fortified port, Midlothian, Scotland; extensive harbor; important Baltic trade in grain and timber, large export trade in coal, cotton, iron; flour mills, shipbuilding yards, breweries, distilleries, engineering and chemical works. L. was pillaged by Eng. in 1544 and 1547. Citadel built by Cromwell, 1650, and taken by Jacobites, 1715. Pop. 1921, 85,000.

LEITMERITZ (50° 33′ N., 14° 9′ E.),

town, Bohemia, Czecho-Slovakia; seat of bishopric; bp.'s palace, cathedral; formerly fortified; breweries. Pop. 17,000.

LEITRIM.—(1) (54° 10′ N., 8° W.), county, Connaught, Ireland; area, *c.* 610 sq. miles; center and N. wild and rugged; watered by Shannon; produces coal, linens, woolens; returns two M.P's. Pop. 65,000. (2) (53° 59′ N., 8° 4′ W.), village, L., Ireland.

LEJEUNE, JOHN ARCHER (1867,) officer, U.S.M.C., born at Point Coupee Parish, La., son of Ovide and Laura Archer Turpin Lejeune. He was educated at Louisiana State University, graduated from the United States Naval Academy in 1888 and from the Navy War College in 1910. After serving on various duties and stations including service in the Spanish American War and participation in the capture of Vera Cruze in 1914, he joined the A.E.F. in France in 1918 with the rank of major general and participated in the battles of St. Mihiel, Blanc Mont Ridge, Meuse-Argonne, also the march to the Rhine and the occupation of Coblenz bridgehead. He returned to the United States in 1919 in command of the 2nd Division and July 1, 1920 was given command of the Marine Corps.

LEJEUNE, LOUIS FRANÇOIS, BARON (1776-1848), Fr. soldier; fought in Napoleonic Wars, then became military artist.

LELAND, CHARLES GODFREY (1824-1903), American author; *b.* Philadelphia, Pa. He graduated at Princeton in 1846, and afterward pursued postgraduate studies abroad. He entered on the practice of law in 1851, but soon abandoned that profession for literature. In 1861 he founded and edited the Continental Magazine. After 1869 he spent most of his life in England. In that country and on the Continent, he made a special study of the life and habits of the gypsies and became an expert in gypsy lore. His publications include *Hans Breitmann's Ballads*, 1867, 70, 95; *The Gypsies*, 1882; *Algonquin Legends of New England*, 1884; *Songs of the Sea and Lays of the Land*, 1895; *One Hundred Profitable Acts*, 1897, and *Kuloskap the Master and other Algonquin Poems*, 1903, the latter being written in collaboration with John Dinely Prince.

LELAND, JOHN (*c.* 1506-52), Eng. antiquary; filled various church appointments, and is remembered for materials he collected, during a six years' tour, connected with the Eng. cathedrals, priories, and abbeys. Stow, Camden and Dugdale benefited largely by his researches.

LELAND STANFORD, JUNIOR, UNIVERSITY, a coeducational seat of higher learning situated at Palo Alto, California, about 30 miles southeast of San Francisco. It was founded in 1885 by Leland Stanford, and his wife, Jane Lathrop Stanford, as a memorial to their only son, who died in 1884 in his fifteenth year. The university grounds cover about 9,000 acres, and the buildings are modeled after the architecture of the old Spanish missions. The endowment which originally embraced about 90,000 acres of land in California, has since greatly expanded, largely by further munificent gifts of money and securities bequeathed by the Stanfords in their wills. In 1922 the endowment fund amounted to $26,450,000. The buildings were seriously damaged by the San Francisco earthquake of 1906. One of their striking features is the Memorial Church, built by Mrs. Stanford in memory of her husband.

Women students are admitted to the limit of 500 only. The curriculum is very extensive and is framed to realize the founders' wishes that the university should 'qualify students for personal success and direct usefulness in life.' It includes bacteriology, marine biology, food research, physical education, law and medicine, as well as all the technical arts and the customary collegiate courses in established subjects of higher instruction. There are degrees in arts, law, medicine, philosophy and engineering, but no honorary degrees are granted. The university's first president was David Starr Jordan. In 1922 there was a student roll of 3,103 and a faculty numbering 102 under the presidency of Ray Lyman Wilbur.

LELEGES, name used by Greeks for ancient people of Caria; they became confounded with the Carians, and various regions of Greece were said to preserve traces of them.

LELY, SIR PETER (1617-80), Eng. artist of Dutch extraction; court-painter to Eng. Charles II.

LEMAÎTRE, FRANÇOIS ELIE JULES (1853-1914), Fr. poet, critic, and dramatist; taught until 1883, after which became dramatic critic to *Journal des Debats*, subsequently publishing his contributions as *Impressions du Theatre* (10 vols. 1888-95); also published a series of literary criticisms, *Les Contemporains*, 1885-95, vols. of verse, several plays, novels, and critical studies of Rousseau, 1907, Racine, 1908, Fénelon, 1910, and Châteaubriand, 1912.

LEMAÎTRE, FRÉDÉRICK (1800-76), Fr. actor; famous for character studies.

LEMAN, LAKE. See GENEVA, LAKE OF.

LEMAN, G. G., GENERAL (1852-1920), Belgian soldier; military governor of Liége at outbreak of the World War; a former lecturer at the Brussels military school; was regarded as one of Belgium's coolest and most determined soldiers; after the alarm provoked by the Agadir affair was promoted lieut.-general and entrusted with completion of the fortifications at Liége. On Aug. 4, 1914, summoned to surrender; at once refused, though it was inadequately garrisoned by some 20,000 men. Attackers under von Emmich had between 120,000 and 130,000 men. For details of siege see LIEGE. On Aug. 6 two Ger. Uhlan patrols, with the help of spies penetrated to Leman's headquarters; the general was saved by Captain Marchand, who shut the door leading to his office; the captain was killed, but the general escaped over a wall at the back of the house. Finally, on Aug. 15, he was taken prisoner while unconscious amidst the ruins of Fort Loncin. He was interned in Germany, but returned to Belgium after the Armistice, and was received with great enthusiasm. Title of Count conferred in July 1919.

LE MANS (48° N., 0° 11′ E.), town, Sarthe, France; has remains of Rom. walls; episcopal see; fine cathedral dating in part from XI. cent., site of former abbey. Manufactures tobacco, machinery. Here Prussians defeated French in a two days' battle, 1871. Pop. 70,000.

LEMBERG, city, Poland (49° 40′ N., 24° E.), cap. of Galicia, on the Peltew R., 185 m. E. of Cracow; seat of three archbishoprics—R.C., Greek Catholic, and Armenian; numerous parks, modern buildings, statues; three fine cathedrals; univ. founded in 1784; technical high school; Dzieduszyoki Museum, with important natural history collection; and Skarbek Theatre. Machinery, ironware, liquors, leather, matches, and candles are manufactured. Pop. 206,600.

Lemberg was probably founded in 1250; cap. of Polish prov. from 1432 to 1772, when it became Austrian. Besieged in 1648 and 1655 by Cossacks, and in 1672 by Turks; captured, 1704, by Swedes. At beginning of World War was captured by Russians under Ruzsky after two days' severe fighting, Sept. 3, 1914. Early in following summer Austrians under Archduke Joseph compelled a Russian retreat, and on June 22 entered the city without opposition. Ukrainians, aided by Germans, captured it in Oct. 1918; retaken by Poles in following month. Again attacked by Ukrainians in 1919, but without success. At close of war passed into the possession of the new Polish state.

LEMERY (13° 50′ N., 120° 45′ E.), town, Luzon, Philippine Islands. Pop. *c.* 11,500.

LEMMING, a member of Mouse Family (*q.v.*).

LEMNISCATE, a curve of which the Cartesian equation is $(x^2+y^2)=a^2(x^2-y^2)$. From the polar equation $r^2=a^2 \cos 2\theta$ it is easily seen that curve consists of two loops, and is symmetrical about x-axis.

LEMNOS, or **LIMNOS,** one of the largest islands in N. Ægean Sea (39° 55′ N., 25° 13′ E.), about 40 m. W. of entrance to Dardanelles; largely mountainous; grain, tobacco, and fruits; chief port, Kastro or Lemnos, on W. coast. Area, 150 sq. m.; pop. *c.* 4,000. Successively an Athenian, Roman, and Turk. possession, it was taken in the Balkan War by Greece, to whom it still belongs. During the World War the Brit. 29th Division was landed on Lemnos, March 1915, which became Sir Ian Hamilton's headquarters. See GALLIPOLI.

LEMON (*Citrus Medica*, var. *Limonum*), a member of the Rutaceæ, cultivated in Mediterranean countries for its fruit, which has a cool, acid flavor, due to presence of citric acid. The l. plant is a variety of the *citron*, which it resembles in general features, and is a large, freely branching shrub of thorny character, the thorns representing the modified leaves of auxiliary branches. The foliage leaves are oval in shape, and the inflorescence is corymbose, with pentamerous flowers. In addition to the juice obtained from the flesh, the fresh rind or peel is of economic importance, yielding on distillation an essential oil, termed 'essence' of l., which it stores in special superficial glands. The rind is also preserved as 'candied peel.'

LEMON, MARK (1809-70), an author, wrote novels, farces, and melodramas, and was a prolific contributor to many periodicals. He edited the *Family Herald* and *Once a Week*, but is best known as one of the founders of *Punch*, over the destinies of which he presided from its birth in 1841 until his death. As editor of *Punch* he was the right man in the right place, and he surrounded himself with such valuable supporters as Thackeray, Jerrold, Leech, Keene, and Tenniel.

LEMONADE, a beverage obtained by extracting the juice of fresh lemons, mixing with water, and sweetening. It

quickly allays thirst, and is useful in febrile and inflammatory complaints, especially when iced. Aerated water flavored with lime juice, tartaric acid, or essence of lemons is also called L.

LEMONNIER, PIERRE CHARLES (1715-99), Fr. astronomer; contributed largely, by continued recommendation of Eng. methods and instruments, to reform of Fr. practical astronomy.

LEMUR or **TRUE LEMUR** (*Lemur*), a genus of Lemuroidea, long-tailed, non-web-footed, with long snouts and large ears; vegetarian and carnivorous; confined to Madagascar.

LEMUS, LEMMING. See MOUSE FAMILY.

LENA (73° 25′ N., 126° E.), river, Siberia; rises near Lake Baikal, flows to Arctic Ocean.

LENAU, NICOLAUS (1802-50), Hungarian poet; his short lyric pieces are the best of his many miscellaneous works.

LENINE, VLADIMIR ILITCH ULIANOV (1870-1924), Russian Soviet leader, *b.* at Simbirsk; is a hereditary noble, *s.* of a state councillor; mother had small estate in Kazan government, and after her husband's death was in receipt of a state pension. After completing course in Simbirsk gymnasium, he entered Kazan Univ., but was expelled for participating in an anti-government students riot. In 1887 his brother Alexander was executed for complicity in plot against life of Alexander III. In 1891, Lenine attended law and economic classes in Petrograd Univ.; four years later he went to Germany; on his return in the same year he was arrested on account of his Socialistic activities, and exiled for three years to Sushenskoe in E. Siberia, being forbidden on expiration of his sentence to reside in any of the large cities, factory centers, or univ. towns of Russia. Released in 1900, again went abroad, and for next seventeen years was a Socialist leader. Appeared in Petrograd in Oct. 1917, and with Trotsky brought about fall of Kerensky. He has been described as 'short of stature, rather plump, with short, thick neck, broad shoulders, round red face, high intellectual forehead, bald head, nose slightly turned up, brownish moustache and short stubbly beard—more like a provincial grocer than a leader of men. He was certainly by far the greatest intellectual force which the Russian revolution has brought to light.' His creed is set forth in his book, *The State and Revolution*, pub. Jan. 1920, in which he attempts to justify himself as the only true disciple of Karl Marx; he regarded the state as a *bourgeois* conception, an instrument for exploiting the oppressed classes. He opposed the anarchist desire to abolish the state without having anything to put in its place; by abolishing capitalism, destroying class differences, 'the proletarian state or semi-state withers away after the revolution.' He was opposed to violence, but admitted that violence is necessary to achieve Communism. The transition stage he described as 'the Dictatorship of the Proletariat.' He showed himself cold, pitiless, and devoid of all sentiment, and ruthless in attempting to force the narrow tenets of his Marxian dogma upon Russia and the whole world. Lenine was attacked by severe illness which compelled him to go into retirement in 1922, and a recurrence in 1923 was even more severe. He finally succumbed Jan. 21, 1924.

LENKORAN (38° 44′ N., 48° 52′ E.), town, Transcaucasia, Russia. Pop. *c.* 9000. L. district has area of 2115 sq. miles. Pop. *c.* 133,000.

LENNEP, a town of Prussia, in the province of Rheinland. It has extensive manufactures in woolen and worsted goods. Pop. 10,500.

LENNEP, JACOB VAN (1802-68), a Dutch novelist, historian and dramatist. He served as attorney general for North Holland but is chiefly known through his literary work. He wrote over 30 plays, poems, historical works and historical romances.

LENNOX (*c.* 56° N., 4° 30′ W.), region in Scotland, comprising Dumbartonshire, parts of Renfrewshire and Perthshire, which gave name at different periods to earldom and dukedom.

LENNOX, CHARLOTTE (*nee* **RAMSAY**) (1720-1804), a British writer, *b.* in New York. She went to London in 1735, and after a brief period on the stage, earned her living by writing. Her chief books are: *The Female Quixote*, 1752; *Life of Harriet Stuart*, 1751; and *Shakespear Illustrated; or The Novels and Histories on which the plays are founded*, 1753-54.

LENNOX, MARGARET, COUNTESS OF (1515-78), was granddaughter of King Henry VII. and mother of Lord Darnley, husband of Mary, Queen of Scots.

LENORMANT, FRANÇOIS (1837-83), a French archæologist, born in Paris. He won the prize in numismatics at the Académie des Inscriptions with his *Classification des Monnaies des Layides*, 1856, and was appointed sub-librarian, 1862. After traveling in

Greece, he accepted the professorship of archæology at the Bibliothèque Nationale, 1874-83. His chief works are: *Les Origines de l'histoire d'apres la Bible* (3 vols.), 1880-84, and *Les Antiquites de la Troade*, 1876.

LE NÔTRE, ANDRÉ (1613-1700), a French landscape gardener. Louis XIV., who heard of his skill, gave him a commission to lay out the gardens of Versailles, the Trianon, the terrace of St. Germain, and the gardens of Fontainebleau, St. Cloud, and Chantilly. He was also the designer of St. James Park and Kensington Gardens in England, and also of Greenwich Park. In addition to these he visited Rome and laid out the gardens of the Quirinal and Vatican.

LENOX, JAMES (1800-80), an Amer. philanthropist, born in New York City. He inherited a large fortune from his father and devoted the greater part of life to the formation of a library and gallery of paintings which in 1870 he gave to the city. His collection now forms a part of the New York Public Library. He gave large sums to many churches and charities.

LENROOT, IRVINE LUTHER, (1869), American legislator; *b.* Superior, Wis. He was educated in the public schools and a business college; later studied law and was admitted to the bar. He took an active part in Republican politics, served as a member of the Wisconsin House of Representatives, 1901-05, was chosen member of Congress in 1909 and served for five successive terms; resigned in 1918 to become a member of the United States senate to fill out the unexpired term of Paul O. Husting, 1918-21, and was re-elected in 1921 for the full six year term. On many questions he has aligned himself with the more liberal wing of the Republican party.

LENS. This term as used in optics denotes a section of transparent material bounded by two surfaces, either both spherical or one plane and one spherical, which refracts luminous rays proceeding from an object so that they produce an image.

Lenses are classified as positive or collective, (including convergent and condensing,) when they increase the convergence of an incident pencil of light, and as negative or dispersive, if the emergent pencil is more divergent than the incident one. Positive lenses are thicker at the middle than at the edges, and include double convex, (both surfaces convex,) plane-convex, (one surface convex, one plane,) and concavo-convex lenses. Negative lenses include double concave, plano-concave and convexo-concave lenses. Images are formed owing to the alteration of the direction of the rays of light. With convergent lenses, in most instances the image real, (*i.e.*) the rays actually converge behind the lens and may be intercepted on a screen. Divergent lenses, however form only virtual images, (*i.e.*) the rays cannot be intercepted as their intersection is apparent only.

The most frequent use of lenses is to form magnified images, as in a microscope or telescope and stereopticon lantern, or diminished images, as in a camera. Lenses may be used to correct defective vision, and to make parallel the rays from a divergent light-source, as in light-houses.

LENS, ruined town, Pas de Calais, France (50° 24′ N., 2° 49′ E.), on Deule R., 10 m. N.E. of Arras; is in rich coalfield; before its almost total destruction by guns of Germans and the Allies during the World War, had iron and steel works, sugar, soap, and wire rope factories. First occupied by Germans early in October 1914; fighting centered S. of town. On Oct. 20 objective changed and the main strength of enemy concentrated before Arras. At beginning of May 1915, Ger. lines formed sharp salient from E. of Loos, across Lens-Béthune road, E. of Aix-Noulette, and reached the Lorette plateau, well to the W. of its highest point; then curved sharply back, covering La Targette and Béthune—Arras road; this last section known as the White Works; object of this salient to protect Lens, the key to the upper plain of the Scheldt and all the flat country towards Douai and Valenciennes. On May 9 Fr. 10th Army, increased to seven corps and aided by vast concentration of artillery, opened the battle of Artois, in which the salient was destroyed and all but the last defenses of Lens were seized. The Lens area was again the scene of important operations in April 1917, and a number of minor offensives were carried out in June. Following the Allied successes on the Somme, Oise-Aisne, Arras, and Ypres fronts, in the summer of 1918, the Germans began to evacuate Lens on Sept. 5, and on Oct. 3 the ruins were in the hands of the British.

LENSES, ACHROMATIC. See ACHROMATIC LENSES.

LENSES, BIFOCAL. See BIFOCAL LENSES.

LENT (A.S. *Lencten*, spring), name given to Church fast before Easter; at first short, but very strict, then three weeks, sometimes six weeks or longer;

now forty days: in Middle Ages very rigorous.

LENTHALL, WILLIAM (1591-1662), Eng. politician; *b.* Henley-on-Thames; Speaker of Long Parliament, 1640; supported Parliament in Civil War; Master of Rolls, 1643; Commissioner of Great Seal, 1648; continued as Speaker till 1653; re-elected, 1654, 1659; temporary Keeper of Great Seal, 1659; helped to bring about Restoration; excluded from act of Indemnity, 1660

LENTIL (*Lens esculenta*), a member of the Leguminosæ (*q.v.*), which grows in the E. Mediterranean region. The seeds, which were the 'pulse' of the ancients, when ground produce a very nutritious flour, often used in patent invalid foods.

LENTULUS, name of Rom. family of patrician *gens* Cornelia. Distinguished members: (1) P. Cornelius Lentulus Sura, implicated in Catiline conspiracy, 63 B.C. (2) P. Cornelius Lentulus Spinther, politician who supported recall of Cicero from banishment. Noted for haughtiness; Cicero uses *lentulitas* to express pride.

LEO, fifth sign of the Zodiac.

LEO, name of thirteen popes: **Leo I.** (pope, 440-61), called *the Great*; succ. Sixtus III.; his letter to Flavian expounds the doctrine of the two natures of Christ, and was accepted by the Council of Chalcedon; met Attila outside Rome, Attila consenting not to attack Rome. His sermons and letters survive. He did much for the prestige of the Papacy. —**Leo II.** (pope, 682-83), sanctioned condemnation of his predecessor, Honorius, for heresy.—**Leo III.** (pope, 795-816) famous for his coronation of Charles the Great as Rom. emperor, 800.—**Leo VIII.** (pope, 963-65), elected while a layman.—**Leo IX.** (pope, 1049-54), a relation of Emperor Conrad II.; held synod, 1049, which decreed celibacy of clergy; led expedition against Normans of Sicily, 1053.

Leo X., Giovanni de' Médici (pope, 1513-21), *b.* 1475; *s.* of Lorenzo de' Medici; *cr.* cardinal deacon, 1489; exercised full rights as cardinal, 1492; lived in Florence, 1492-94; devoted himself to art, etc., 1500, living in Rome. He was elected pope on the death of Julius II. The history of the Papacy during his reign is an intricate struggle in which L. strove to preserve the papal power by keeping foreign powers out of Italy. The Turks menaced W. Europe, but a projected crusade came to nothing. His reign was marked by Luther's revolt from the Papacy, the significance of which L. failed to realize. He was greatest as a patron of art and lit.; he encouraged Raphael and reorganized the Univ. of Rome. An astute politician and man of the world, he lacked spirituality and moral zeal when the Church sorely needed reform.—**Leo XII.,** Annibale Della Genga (pope, 1823-29), *b.* 1760; held various diplomatic appointments from 1794; during his reign a careful administrator, but reactionary.

LEO XIII., GIOACCHINO PECCI (pope, 1878-1903), *b.* 1810; ed. at Viterbo and Rome; app. nuncio to Brussels, 1843; abp. of Perugia, 1846-78; cardinal, 1853; elected pope on the death of Pius IX. His reign was one of great activity, political, social, and religious. He firmly upheld the necessity for the restoral of temporal power to the Papacy, but did not needlessly quarrel with the Ital. government. He was energetic as a statesman and entered into relations with many sovereigns in Europe and Asia, securing liberty for Roman Catholics in Russia. He encouraged learning, and his encyclicals showed some sympathy with socialism.

LEO, six Byzantine emperors: **Leo I.** (400-74), defeated Huns in Dacia; sent fleet against Vandals.—**Leo III.** (680-740), conquered Saracens, 719; introduced religious and civil reforms; forbade image-worship; began separation of Gk. from Rom. Church.—**Leo V.,** emperor, 813-20; fought against Arabs; defeated Bulgarians; repressed image-worship; assassinated.—**Leo VI.,** emperor, 886-911; lost Thessalonica to Mohammedan pirates.

LEOFRIC (*d.* 1057), Earl of Mercia from about 1030; ruled over the Welsh Marches.

LEOMINSTER.—(1) (52° 13′ N., 2° 45′ W.), town, Herefordshire, England; site of former monastery and priory. Pop. 1921, 5,539.

LEOMINSTER, a town of Massachusetts, in Worcester co. It is on the Nashua river, 40 miles N.W. of Boston. Its industries include the manufacture of combs, paper, jewelry, buttons, etc. Pop. 1920, 19,745.

LEON.—(1) (42° 33′ N., 5° 40′ W.), N.W. province, Spain; area, *c.* 5,986 sq. miles; crossed by Douro and Minho; agriculture is principal industry; formerly part of independent kingdom of L.; for sovereigns, see under FERDINAND. Pop. 1920, 391,855. (2) (42° 37′ N., 5° 37′ W.), capital, L., Spain; seat of bishopric; XIII.-cent. cathedral, bp.'s palace; manufactures machinery, linen, leather. Remains of Rom. walls. Pop. 17,000. (3) (12° 32′ N., 86° 54′ W.), town, Nicaragua; seat of bishopric; his

cathedral, univ., bp's palaces. Pop. 1920, 47,234.

LEON, a province of central Equador. It has an area of about 2,600 sq. miles. In the northeastern part is the volcano, Copopaxi. Pop. 125,000.

LEÓN, LEÓN DE LAS ALDAMAS (21° 1′ N., 101° 15′ W.), cathedral town, Mexico; manufactures leather, textiles. Pop. 63,000.

LEONARD, WILLIAM ANDREW (1848), a bishop, born at Southport, Conn., son of William Boardman and Louisa Bulkley Leonard. He was educated at Phillips Academy, Andover, Mass., St. Stephen's College, Annandale, N.Y. and at Berkley Division School, Middletown, Conn. He became a deacon in 1871 and a priest in 1873 of the Protestant Episcopal Church and after being rector of various churches including St. John's, Washington from 1880-9, he was consecrated bishop of Ohio, Oct. 12, 1889. Author: *History of the Christian Church*, 1878; *A Faithful Life*, 1888; *Bedell Lectures, Witness of American Church to Christianity*, 1894 and *Biography of Stephen Bank Leonard*, 1909.

LEONARDO DA VINCI (1452-1519), Ital. painter, sculptor, architect, and engineer. Showing precocity in drawing, he was sent to study at Florence with Andrea del Verrochio, having Perugino for a fellow-pupil. He began his professional career about 1472, when he received the patronage of Lorenzo de' Medici, and about 1480 proceeded to the East as engineer to the sultan of Cairo. Two years later he settled in Milan, where he presently painted his famous *Last Supper*, a masterpiece which had the distinction of an elaborate criticism and description from Goethe's pen. After painting other pictures in Milan, and, as an engineer, devising a system of irrigation of the plains of Lombardy, he removed to Florence, and in 1502 became architect and engineer to Cæsar Borgia, then Duke of Romagna. The next outstanding incident in his career was the contest with his young rival Michael Angelo, when both were commissioned to decorate the Sala del Consiglio in the Palazzo della Signoria with historical scenes. About 1504 was completed the most celebrated of his easel pictures, a half-length portrait of Mona Lisa, third wife of Zanobi del Giocondo; this was stolen from the Louvre, 1911. Leonardo's later years were given to the service of France, Francis I. having, in 1516, assigned him an annual allowance of 700 scudi and given him the use of the Chateau Cloux, near Amboise, where he died, not, as often erroneously stated, in the royal arms. Collections of his pictures, all emphasizing his supreme position as an artist, are preserved at Milan, Florence, Paris, Vienna, Venice, the British Museum, and the Royal Library, Windsor. He wrote a *Trattato della Pittura*, dealing with the details of his art, published in 1651, and in an Eng. translation, 1721. A portrait of Leonardo from his own hand is in the Royal Library at Turin.

LEONARDO OF PISA, Ital. mathematician of XIII. cent.; nicknamed 'Dunce.' Published *Liber Abaci* (deals chiefly with commercial arithmetic), *De Practica Geometrioe*, and scientific papers.

LEONCAVALLO, RUGGIERO (1858-1919), Ital. operatic composer. Wagner induced him to write one-act opera, *I Pagliacci* (Milan, 1892), a great success; *Chatterton*, a failure at first, won more favor when re-written, 1896. Other operas, *Medici*, 1893; *La Boheme*, 1897; *Zaza*, 1900; *Roland von Berlin*, 1904; *Maia*, 1910, and *Malbruck*, 1910, none of which have repeated the success of *Pagliacci*.

LEONIDAS (*fl.* 491-480 B.C.), king of Sparta; held *Thermopylae* against Persians till taken by treachery; pattern of bravery.

LEONTIASIS OSSEA, a rare disease in which there is an overgrowth of bone over the forehead, jaws, and bones of the skull, leading to much disfigurement, while painful symptoms and even death may ensue from the pressure on the brain. In some cases treatment by chiselling away masses of bone is possible.

LEONTINI (37° 16′ N., 14° 59′ E.), ancient town, Sicily, to S.E. of L. lake; founded by Gk. colonists, 730 B.C.; ruined by Saracens, 848 A.D. Some bronzes have been excavated. Site of modern *Lentini*, which has trade in oil, wine, cereals. Pop. 17,500.

LEOPARD, see under CAT FAMILY.

LEOPARD BANE. See ARNICA.

LEOPARDI GIACOMO, COUNT (1798-1837), Ital. poet; after several minor pieces, he wrote the *Apprassamento alla Morte*, 1819, a long poem upon death after the manner of Petrarch; edited Cicero and Petrarch, 1825-26; pub. 1827, *Operette Morali*, a witty and ironic series of dialogues, modeled on Lucian and faultless in style. His chief claim to greatness is as classic and stylist; other important works are *La Ginestra, Song of the Wandering Shepherd*.

LEOPOLD I. (1790-1865), king of

Belgians; fought against Napoleon; declined Gk. crown, 1830; elected first king of Belgians, 1831.

LEOPOLD II. (1835-1909), king of Belgians; succ., 1865; founded Congo Free State, for administration of which he was much criticised; acquired vast wealth; greatly developed Belgium.

LEOPOLD I. (1640-1705), Holy Rom. emperor; king of Hungary, 1655; Bohemia, 1657; emperor, 1658. Reign marked by wars against Sweden, Turks, France; concluded peace with Sweden, 1660; made truce with Turks after latter's defeat by Monticucculi, 1664; waged three wars against Louis XIV. of France, against whom he formed Grand Alliance, 1689; persecuted Protestants in Hungary; insurrection followed, in which rebels were aided by Turks, but ultimately defeated.

LEOPOLD II. (1747-92), Holy Rom. emperor; Grand-Duke of Tuscany, 1765; reformed administration; emperor, 1790; negotiated with England to check power of Russia and Prussia, crowned king of Hungary, 1790, promising to observe constitution; made truce with Turks, 1790; concluded peace at Sistova, 1791; combined with king of Prussia to declare readiness for intervention in France during Revolution, 1791; formed alliance with Prussia, 1792.

LEOPOLD II. (1797-1870), Grand-Duke of Tuscany; succ., 1824; reformed administration; granted constitution, 1848; sent troops against Austria on outbreak of War of Ital. Independence; revolutionary agitations subsequently arose; republic proclaimed, Feb. 1849; L. went to Gæta; accepted invitation to return, April; made treaty with Austria, 1850; revoked constitution, 1852; abdicated, 1859.

LEOPOLD I., PRINCE OF ANHALT-DESSAU (1676-1747), *b.* Dessau; succ. as Prince of A.-D., 1693; fought in Netherlands, 1695, and in war of 1697; distinguished himself in Span. Succession War, became a general field-marshal, 1712; defeated Charles XII., 1715, and after winning victory of *Kesselsdorf*, 1745, he retired from active service. A devout Lutheran, a brilliant soldier, a stern disciplinarian, he helped to make the Pruss. army a great force.

LEOPOLD II. (2° S., 18° 9′ E.), lake, Belgian Congo, Africa.

LEOVIGILD, Visigothic king in Spain, 568-86; an Arian; his *s.* Hermenegild executed for rebellion and adherence to orthodoxy.

LEPANTO, BATTLE OF, action fought between allied fleets of Spain and Ital. States, under Don John of Austria, and Turk. fleet under Ali Pasha, Oct. 7, 1571; Turks utterly defeated.

LEPIDOPTERA, BUTTERFLIES AND MOTHS (Gr. *lepis*, 'a scale'; *petron*, 'a wing'). Owing to their size and beauty, butterflies and moths are amongst the best known of insects, *c.* 50,000 species being scattered over all the world. The name 'Lepidoptera' signifies the presence of scales exceedingly minute and dustlike, but often brilliantly colored, which cover the four large, moderately veined wings. To actual pigment in the scales, which, as in *Morpho*, may number a million and a half, or to close ribbing on their upper surface, are due the beautiful colors and metallic sheen so familiar in the group. But other features are very characteristic. Adult lepidoptera feed on vegetable matter, sucking the juices from plants and flowers, and for this purpose some of the mouth parts (first maxillæ) form a long 'tongue' or proboscis, which in the hawk moths may be 10 in. in length but which can be coiled up like a watch spring when not in use. With this is associated a pumping apparatus in the head.

The changes which pass in the history of the individual are great and abrupt. The eggs, marvelous in variety of shape and sculpturing in different species, are laid singly or in patches either on a chance object or on the particular plant on which the larvæ are to feed—a complete brood numbering from a few dozens to many thousands. In a few days or months, as the case may be, the larva or caterpillar appears and sets about its life-work, which is simply to feed ravenously, to grow, rest, and moult. In shape it is wormlike, often hairy, with a large head and biting mouth parts, three thoracic segments, each with a pair of clawed limbs—corresponding to those of the adult—and ten abdominal segments, with usually four or five pairs of clasping pro-legs. When the caterpillar has collected much reserve food material in its 'fatty body' it enters a trance, the pupal stage, the chrysalides of butterflies being suspended from a leaf or branch, often by a silken girdle, the pupæ of moths lying generally concealed in the ground or under bark, or hidden in a cocoon, such as those of the large Bombycid moths, which furnish the world's silk-supply. Within the hard pupal skin great changes foreshadow the limbs, wings, and organs of the adult, and finally the imago bursts forth, and after resting a few moments to dry its wings, soars into the air.

The length of the life-history is very

variable, some species having only one generation in three years, while others have five generations a year.

Butterflies (Rhopalocera) are mostly day-fliers; antennæ with a club-like or swollen tip; hind-wings with a shoulder which edges under the fore-wing, but without a bristle or 'frenulum'. Of the butterflies examples are: the purple emperor (*Apatura iris*), the tortoiseshells and the peacock (*Vanessa*), the fritillaries (*Argynnis, Melitoea*), the blues (*Lycoenidoe*), and the cabbage butterfly (*Pieris brassicoe*), whose caterpillars are so destructive in the garden. But none of these compare in brilliancy of coloring or size with the gigantic *Morphos* of tropical Asia and America, sometimes with a wingspan of close on 10 in.

Moths (Heterocera) are mostly night-fliers; the antennæ are very seldom club-like at the tip. Hind-wing is without a distinct shoulder, but with a bristle ('frenulum') which engages with a projection or tuft of scales on the fore-wing, for purposes of support. In some cases a frenulum is absent, but never where the antennæ are butterfly-like. Familar examples are: the hawk moths (*Sphingidoe*), including the death's-head, the clear wings (*Sesiidoe*), resembling Hymenoptera, the owl moths (*Noctuidoe*), and the clothes moths (*Tineidoe*). But those which most concern man are the large silk spinners (*Bombycidoe*), of which the true silkworm moth (*Bombyx mori*) has been introduced to Europe, its larval cocoons supplying the finest silk of commerce.

LEPIDUS, Rom. family of *gens* Æmilia; famous III. cent. B.C. to I. cent. A.D.; among its consuls, *pontifices maximi*, etc., was Marcus Æmilius (*d.* 13 B.C.), of proverbial inferiority as 'the Lepidus of the Triumvirate.'

LEPROSY, chronic infectious disease caused by a specific bacillus, *Bacillus leprae*, characterized by the development of nodules or more diffuse growths of granulation tissue in the skin and mucous membranes, or in nerves, the former type being termed *tubercular* l., and the latter *anaesthetic* . The disease existed in China and India in very ancient times; it is dealt with somewhat fully in the Book of Leviticus, and it is supposed to have been brought to Europe from the East by the Crusaders. Although common in the Middle Ages, it is now gradually disappearing, in Europe occurring practically only in Norway, Russia, and parts of the Mediterranean coast, but it is more common in Asia, on the coast of Africa, in some of the Pacific Islands, and in Central and South America.

For a considerable time, perhaps years, before the appearance of definite symptoms, an individual affected by l. may suffer from feverish attacks, weakness, and constitutional disturbances, and then, in the tubercular variety, brownish nodular spots appear on the skin, which are tender, the affected area gradually increasing in extent, while in the anæsthetic variety the superficial nerves are first thickened, symptoms of nerve irritation appear, and then of destruction of the nerves with gangrene of extremities, etc. The disease usually runs a chronic course of ten, or, in the anæsthetic variety, as much as fifteen or twenty years, but may disappear entirely at practically any time. The treatment is to segregate lepers so as to prevent infection, or to remove a person affected to a different climate, while appropriate surgical measures relieve unnecessary pain. Chaulmugra and Gurgun oils, internally and externally, are often of benefit.

LEPSIUS, KARL RICHARD (1810-84), Ger. Egyptologist; wrote many works in his special branch of study, which he conducted on scientific lines.

LEPTIS MAGNA (32° 38′ N., 14° 4′ E.), ancient Phœnician town, N. Africa; was commercial center; ruins of fortifications, theatre, etc., remain. Site of modern Lebda.

LEPTIS PARVA (*c.* 35° 35′ N., 10° 55′ E.), ancient Phœnician town, N. Africa; fortified; ruins remain. Site of modern Lamta.

LE PUY, LE PUY EN VELAY (45° 2′ N., 3° 53′ E.), town, Haute-Loire, France; episcopal see; has XII.-cent. Romanesque cathedral and XI.-cent. baptistery; manufactures thread and guipure lace, textiles, chocolate, spirits; formerly fortified. Pop. 22,000.

LE QUEUX, WILLIAM TUFNELL (1864), novelist and traveler; author of mystery and spy stories such as *Guilty Bonds*, 1890; *Secrets of Monte Carlo*, 1899; *German Spies in England*, 1915; *The Way to Win*, 1916; *The Zeppelin Destroyer*, 1916; *Secrets of Potsdam*, 1917. *Rasputin*, 1917.

LÉRIDA.—(1) (41° 52′ N., 1° 10′ E.), N. province, Spain; area, 4690 sq. miles; drained by affluents of Ebro; wine, oil, livestock. Pop. 1920, 292,423. (2) (41° 34′ N., 0° 20′ E.), town, capital of above; XVIII.-cent. cathedral; episcopal palace; old cathedral now used as barracks; former convent now used as hospital. Pop. 25,000.

LERMA, DUKE OF, FRANCISCO DE SANDOVAL Y ROJAS (1552-1625),

Span. minister under Philip III.; continued war against England; incompetent.

LERMONTOV, MIKHAIL YUREVICH (1814-41), Russ. poet; wrote great lyrics; *Ismail-Bey*, *Walerik*, *A Hero of our Time* (novel); killed in duel.

LERO DE TEJADA, SEBASTIAN (1825-89), pres. of Mexico, 1872-77.

LEROUX, PIERRE (1798-1871), Fr. economist of extreme socialistic views; his philosophy was a mystical eclecticism, and his theories quite unpractical.

LEROY-BEAULIEU, HENRY JEAN BAPTISTE ANATOLE (1842-1912), Fr. author and publicist; wrote several works on contemporary politics. He was prof. of modern history at the Ecole Libre des Sciences Politiques.

LE SAGE, ALAIN RENÉ (1668-1747), Fr. author; *b.* in Brittany, and in youth employed on farm; for forty years fought against poverty, translating and doing other work, but, above all, making observations; published *Crispin rival de son maitre*, a little play in prose, 1707; *Le Diable boiteux*, which won him fame, 1707; *Turcaret*, 1709, a severe satire on financiers, who endeavored to stop its production, but Le Sage was under protection of the Dauphin. His novel, *Gil Blas*, 1715-35, great comic masterpiece, setting of which is in Spain, belongs to all times and all countries.

LESBOS, MYTELENE (39° 14′ N., 26° 20′ E.), Greek island, in Ægean Sea; early settled by Æolian Gks.; became famous as school of Gk. lyrical poetry; has associations with Sappho, Theophrastus, Alcæus, Terpander, Arion, Turkish from 1462 to 1920. Area, 675 sq. miles; surface hilly, rising to over 3000 ft.; upper districts wooded; lower ground produces olives, grapes, figs. Chief town, Mytelene, on Kastro, has shallow harbor, cathedral; formerly fortified. Pop. *c.* 130,000.

LESINA.—(1) (43° 8′ N., 16° 40′ E.), island, off coast of Dalmatia, Adriatic Sea; area, *c.* 120 sq. miles; produces wine, fruit. Pop. *c.* 19,000. (2) (43° 10′ N., 16° 26′ E.), capital of above, episcopal see.

LESION, injury or damage; in pathology, a morbid change in an organ.

LESKOVATZ (43° 7′ N., 21° 54′ E.), town, Serbia; hemp. Pop. 14,500.

LESLEY, JOHN (1527-96), Scot. historian; studied at Aberdeen and in France; Catholic leader during Reformation; bp. of Ross, 1565; loyal friend of Mary, Queen of Scots; imprisoned in London, then banished; bp. of Coutances, 1593; wrote history of Scotland.

LESLIE, CHARLES ROBERT (1794-1859), Eng. artist, of American parentage; painted Queen Victoria's Coronation; professor of painting, Royal Academy, 1848. Fine examples of his pictures are to be found in Tate Gallery and the S. Kensington Museum.

LESLIE, FRANK (*b.* Henry Carter); (1821-80), Eng. illustrator and American publisher; *b.* Ipswich, England. Although he was apprenticed to the dry-goods business, the work was uncongenial, and he abandoned it to study drawing and engraving. Sketches by him in The Illustrated London News were signed 'Frank Leslie,' and that name he afterwards retained. He came to America in 1848, worked on several periodicals and in 1854 established Frank Leslie's Illustrated Newspaper. This became very popular and he amassed a considerable fortune, which he augmented later through other publications, notably the Popular Monthly.

LESPINASSE, JULIE JEANNE ÉLÉONORE DE (1731-76), Fr. author; most distinguished hostess of her time; D'Alembert was habitué of her *salon*; victim of successive unfortunate *affaires du coeur* which give poignancy to her famous *Letires*, pub. posthumously.

LESSE (49° 59′ N., 5° 10′ E.), river, Belgium; joins Meuse.

LESSEPS, FERDINAND DE (1805-94), Fr. diplomat; *b.* at Versailles; ed. at Paris; employed in consular service at Lisbon, 1825-27; Tunis, 1828; Alexandria, 1832; conceived project of making Suez Canal; consul, Cairo, 1833; subsequently consul-gen., Alexandria; distinguished for zeal during plague, 1834-35; consul at Rotterdam, 1839; Malaga, 1840; Barcelona, 1842; minister at Madrid, 1848; retired from diplomatic service, 1849. Introduced Suez Canal scheme, 1854; obtaining concession from Said Pasha, company organized, 1858; work began, 1859; canal opened, 1869; received Grand Cross of Legion of Honor. Undertook Panama Canal, 1881, on insufficient money; charged with fraud; sentence of imprisonment not carried out.

LESSING, GOTTHOLD EPHRAIM (1729-81), Ger. critic and dramatist; *b.* Kamenz (Saxony); studied theol., med., and philology at Leipzig, 1746-48, and wrote *Der Junge Gelehrte*, *Der Freigeist*, *Der Misogyn* (plays). L. spent most of the years 1748-55 in Berlin as journalist and critic; to this period belong his critical writings, *Das Neuste aus dem*

Reiche des Witzes, Rettungen, and *Miss Sara Sampson* (tragedy); lived in Leipzig, 1755-58; returned to Berlin and wrote *Fabeln* and *Philotas* (tragedy), 1759, and his share of the *Briefe die neuste Literatur betreffend* (1759-65). In Breslau (1760-65) L. wrote parts of his great critical work, *Laokoon* (pub. 1766), and his fine comedy, *Minna von Barnhelm* (pub. 1767); app. director of National Theater, Hamburg, 1767; became court librarian at Wolfenbüttel, 1770, until his death. Three of his best works belong to these years, (*viz.*): *Wie die Alten den Tod-gebildet*, 1769; *Emilia Galotti* (tragedy), 1772; and the great drama, *Nathan der Weise*, 1779. L. founded modern drama and crowned the *Aufklarung* movement in Germany.

L'ESTRANGE, SIR ROGER (1616-1704), an English pamphleteer, *b.* at Hunstanton. In 1639 he accompanied Charles I. on his expedition against the Scots and during the Civil War was captured by the Parliamentarians in an attack on Lynn and condemned to death as a spy. He was reprieved, and imprisoned in Newgate, but escaped in 1648, and fled to the Continent, returning to England in 1653, and making terms with Cromwell. He was made Licenser of the Press at the Restoration. In 1663 he established the newspaper *The Public Intelligencer*, and also *The News*, which in 1665 became the *London Gazette*. In 1679 he founded the *Observator*. He lost his office as licenser at the revolution of 1688. He was a man of letters of considerable ability, and made some good translations of Josephus, Cicero, Æsop, Erasmus, and Quevedo.

LE SUEUR, EUSTACHE (1617-55), one of the founders of the Fr. Academy of Painting; executed many religious and mythological pictures, of which the Louvre possesses 47 specimens.

LE SUEUR, JEAN FRANÇOIS (1760 or 1763-1837), a French musical composer, *b.* near Abbeville. He was musical director at the Cathedral of Notre-Dame, Paris, from 1786-87. From 1795-1802 he was inspector of studies at the Paris Conservatoire, and in 1804 he was appointed Maestro di Capella to Napoleon, for whose coronation Le S. composed the musical service. Louis XVIII. retained him at his court, and in 1818 appointed him professor at the Paris Conservatoire. His operas include *Le Caverne*, *Ossian*, and *Paul et Virginie*.

LETHAL, mortal or deadly; l. chamber, a receptacle or apartment in which animals are killed by poisonous gases.

LETHARGY, drowsiness; in med., a condition of profound sleep or unconsciousness from which a person can be awakened only with great difficulty.

LETHBRIDGE, a town of Canada in the Province of Alberta, about 120 miles south of Calgary. It is the centre of an important farming and coal mining region and its industries are chiefly connected with agriculture and the mining of coal. Pop. about 15,000.

LETHE (class. myth.), riv. in lower world from which departed spirits drink to obtain forgetfulness of past; first mentioned as a river by Plato (*Republic X*). *Lethal chamber* is apartment in which animals are swiftly and painlessly killed by poison gases.

LETTER OF MARQUE, a license or commission granted by the government to a private person to fit out an armed ship or privateer to capture the enemy's ships and merchandise in time of war or in reprisal for damage done. Privateering was abolished by the Declaration of Paris in 1856, so that the granting of 'letters of marque' has fallen into disuse.

LETTERS. See ALPHABET, EPISTLE.

LETTERS PATENT, or **LETTERS OVERT,** writings sealed with the Great Seal of England, declaring from the sovereign that a person or public company may do certain acts or enjoy certain privileges, which could not be done or enjoyed otherwise; so called because they are *open* and ready to be shown.

LETTOW - VORBECK, GENERAL VON (1869), German soldier; fought in China (1900-1), and against Herero and Hottentots (1904-6), being severely wounded; commander of marine battalion at Wilhelmshaven, and member of General Staff. His experiences in German S.W. Africa led to his appointment to the command of the forces in German E. Africa (spring 1914). Though decisively beaten, he resisted all efforts to 'round up' his remaining forces during four years of tropical fighting. He was in Northern Rhodesia when the Armistice was declared, and immediately surrendered.

LETTS, See LITHUANIA.

LETTUCE (*Lactuca sativa*), a member of the *Compositae*, the tender leaves of which are used in salads. The flowers which are small, are borne in panicles resembling those of the hawkweed.

LETTUCEBIRD, a name sometimes given to the American goldfinch. It is one of the most widely distributed seed-eating American birds.

LEUCADIA (38° 43′ N., 20° 40′ E.), former name of Santa Maura, one of Ionian Islands.

LEUCITE (Gk. *leukos*, white), a rock forming mineral composed of potassium and aluminum, occurring in volcanic rocks. Color, white and shades of grey; was formerly called white garnet, owing to color and form of crystals, which are dull and opaque though sometimes transparent. Leucite rocks contain l., and are rare, though widely distributed. They are mostly lavas belonging to Tertiary period.

LEUCOCYTES. The white corpuscles of the blood. There are five varieties: the *polymorphonuclear*, constituting about 70% of the total; the *eosinophile*, forming about 2%; the *lymphocyte*, forming about 20%; the *macrocyte*, forming 4%; and the *basophyte*, which is rare in the blood of adults. The function of the white corpuscles is to attack and destroy bacteria which enter the blood, and so to defend the body against disease. They are far less numerous than the red corpuscles, the normal number ranging from 5,000 to 10,000 per cubic millimeter. In the case of injury to a tissue, however, there is a great increase in the number of leucocytes. This increase is apparently due to the attraction exercised by injurious bacteria which find a footing on the injured tissue. The leucocytes behave similarly to amoebae, gliding along by pushing out part of their substance. They move towards bacteria, flow around them until they have them completely enfolded in their substance, and then digest them. As long as the leucocytes can hold their own against bacteria, the body remains healthy, but when the bacteria multiply so rapidly that the leucocytes can no longer cope with them, illness results. The leucocytes increase in numbers, normally, during the process of digestion and during pregnancy. A condition where the number becomes excessive is known as *leucocythaemia* or *leucaemia*, and is frequently accompanied by anaemia an enlargement of the spleen and lymphatic glands. An excess of the eosinophile cells is characteristic of some forms of insanity. A marked diminution in the number of leucocytes is called *leucopenia*.

LEUCTRA (38° 17′ N.; 23° 14′ E.), small town, Boeotia, Greece, where Thebans defeated Spartans in 371 B.C.

LEUTHEN (51° 5′ N., 16° 48′ E.), village, Pruss. Silesia, Germany; where Frederick the Great defeated Austrians, 1757.

LEUTZE, EMANUEL (1816-68), a German-American painter, noted for his historical pictures, *b.* in Gmünd, Würtemberg. From 1841-59 he studied art at Düsseldorf, Munich, Venice, Rome, and other places. He returned to America and painted various historical pictures, amongst which are: 'Westward the Star of Empire takes its way' (Capitol, Washington), 'Washington Crossing the Delaware' (Kunsthalle, Bremen), 'Columbus before the Council at Salonica,' 'Cromwell visiting Milton,' and some portraits. He died at Washington.

LEUTZE, EUGENE HENRY COZZENS (1847), a rear-admiral, U.S.N.; *b.* at Dusseldorf, Prussia, *s.* of Emanuel and Julia Leutze. He was appointed to the United States Naval Academy by President Lincoln from the District of Columbia in 1863 and graduated in 1867. He served during the Civil War and later during the Spanish American War participated in the taking of the city of Manila after which he served on various duties and stations, including the command of several U.S. ships, until 1905 when he became commandant of the Navy Yard at Washington and superintendent of the naval gun factory. He was made a rear-admiral in 1907 and 2 years later was retired by the operation of law but continued on active duty and in 1910 was commandant of the Navy Yard and Station, New York.

LEVALLOIS - PERRET (48° 51′ N.; 2° 20′ E.), suburb, Paris, France. Pop. 1921, 73,639.

LEVANT (*c.* 34° N., 34° E.), eastern end and shores of Mediterranean.—Levanter, prevailing summer wind (easterly) off N. African coast.

LEVÉE (Fr. *lever*, to rise): (1) A morning ceremonial visit to the sovereign of such gentlemen as have the right of entry. The name arises from the fact that these visits were first inaugurated by the kings of France who held these receptions in their dressing-rooms. A L. is distinguished from a 'drawing-room' in England, inasmuch as only gentlemen attend the former. (2) An embankment built on the side of rivers in the south of the U.S. to prevent overflowing during floods. The most noteworthy system of levees is that of the Mississippi.

LEVEL. See SURVEYING.

LEVELLERS, Eng. political party during Great Rebellion; came into prominence, 1647; opposed monarchical government; dissatisfied with parliamentary government after king's death.

broke into open revolt, 1649; repressed by Cromwell and Fairfax; gradually lost importance.

LEVEN, ALEXANDER LESLIE, 1ST EARL OF (*c.* 1580-1661), Scot. soldier; distinguished in service of Charles IX. and Gustavus Adolphus of Sweden; commanded Scots army against Charles I., 1640; took Edinburgh Castle, defeated king at *Newburn*; in Civil War commanded Scots army against king at *Marston Moor*; took Newcastle, 1644; served against Cromwell at *Dunbar*, 1650.

LEVEN, LOCH (56° 12′ N., 3° 22′ W.), lake, Kinross-shire, Scotland; has seven islands, including Castle Island, on which is castle associated with Mary, Queen of Scots, and St. Serf's, which has ruined priory. Loch is famous for pink trout.

LEVER, a rigid bar which turns about a point called the fulcrum. The points of the bar on each side of the fulcrum are called the arms. By applying force at one point on the L. a weight is raised or resistance overcome at another point. There are three classes of L's. according to the position of the fulcrum in regard to the power and weight. In a L. the power multiplied by its arm, or distance from fulcrum, is equal to the weight multiplied by the arm. If the force applied to the L. is less than the resistance of the weight, the L. is said to work at a mechanical advantage, if *vice versa*, at a mechanical disadvantage. L's. of the first class may work either at an advantage or disadvantage, or the force may be exactly equal to the weight. L's. of the second class always work at an advantage, and those of the third class always at a disadvantage.

LEVER, CHARLES JAMES (1806-72), Irish novelist; ed. Trinity Coll., Dublin, where he was noted for his lawlessness and ingenuity; became physician and entered Consular service; *a* while consul at Trieste; had a European reputation for generosity, extravagance, and eccentricity. Novels include *Charles O'Malley, Harry Lorrequer.*

LEVERAGE, (CARL) HENRY (1885), author; *b.* at London, Eng., *s.* of John Henry and Susie Grove Leverage. He was brought to the United States in infancy and was educated at the Denver Manual Training High School and at the University of Colorado where he studied electrical engineering. He was the inventor of various electrical devices for magnetic transmission on automobiles and was the author of *Whispering Wires*, 1918; *The White Cipher*, 1919; *Where Dead Men Walk* and *The Shepherd of the Sea*, 1920; *The Ice Pilot*, 1921 and also many serial novels and numerous short stories.

LEVERING, ALBERT (1869), an American illustrator; *b.* at Hope, Ind., *s.* of Levi Lemuel and Sarah Martha Youngling Levering. He was educated at Columbia (Ind.) High School. After studying architecture with his *f.* he was engaged in the practice of architecture for 8 years but gave up architecture and became connected with the Minneapolis Times and was later with the Chicago Tribune and the New York American. He then studied drawing in Munich and after being associated with various magazines, including Life and Puck, joined the staff of the New York Sunday Tribune. He was the illustrator of many humorous books.

LEVERRIER, URBAIN JEAN JOSEPH (1811-77), Fr. astronomer; known chiefly for brilliant investigation of perturbations of orbit of *Uranus* (1846). Adams independently treated same problem (1845) with same conclusion, which led to discovery of planet *Neptune* by Galle of Berlin.

LEVI. See LEVITES.

LEVIATHAN, Hebrew term for sea monster; also applied to other big creatures.

LEVIATHAN, an American ship formerly the German *Vaterland*. It was seized at the outbreak of the World War by the United States government and was used as a transport. It was the largest vessel afloat and was built to carry at one time, over 10,000 soldiers. Following the war it was reconditioned for freight and passenger service. The Leviathan has a tonnage of 54,282. The length is 907.6 feet and the breadth 100.3. With the Majestic, formerly the Bismarck, it ranks as the largest vessel afloat.

LEVIRATE, custom (of uncertain origin) whereby a man must marry his *bro.'s* widow; very common in primitive times and still existing amongst certain savage tribes; permitted under certain conditions amongst the Jews.

LÉVIS.—(1) (46° 47′ N., 71° 10′ W.), town, Quebec, Canada. Pop. *c.* 7500. (2) 46° 38′ N., 71° 15′ W.), county, Quebec. Pop. *c.* 26,000.

LEVITES, name given to the body of men in ancient Jerusalem who presided over the Temple services. Traditionally they were descendants of Levi. The derivation of their name and their origin are really quite uncertain; some think it connected with the name of the

priests of an Arabian deity. In the earliest times there seems to have been no priestly clan in Israel, and it is at least a plausible conjecture that the L's were a southern tribe, which became incorporated. Various stages of development can be traced in the Old Testament. In the older books, which reflect the conditions of things under the monarchy, all L's were or could be priests. In the second stage, on the suppression of local shrines and the establishment of the law of the one sanctuary, the priests had to come to Jerusalem, but could not serve at the altar. In the fully developed ritual of post-Exilic times, only the 'sons of Aaron' are true priests, the L's as a whole being servants. The exact process by which these changes came about is unknown.

LEVITICUS, BOOK OF, fourth of so-called Mosaic books, part of the Priestly Code, the latest of the elements which make up the *Pentateuch*. Chapters 17-26 stand somewhat apart. Chapters 1-6 deal with the different sorts of sacrifices —burnt-offering, meal-offering, peace-offering, sin-offering, and guilt-offering; then follow ritual directions for the priests; 8-10 describe the ceremonies of admission to the priesthood; 11-16 give the regulations about clean and unclean meats, which animals may be used for food and which may not; 12-15 deal with personal purity; and 16 the ritual for the Day of Atonement. Chapters 17-26 are sometimes called the Law of Holiness. They resemble P rather than the other sources of the Pentateuch, but have peculiarities of style, and show close resemblances to the Book of *Ezekiel*. They form an originally separate body of laws, which have probably been modified and inserted into the book. They provide interesting points of agreement and contract with 'the book of the Covenant,' *Exodus* 20-23. The Law of Holiness, sometimes symbolized by H, is less detailed. It is possible that fragments from the same source as H exist elsewhere. H was perhaps compiled as the result of the Law of the One Sanctuary, (*i.e.*) sacrifice was to be offered only in Jerusalem. It is both ritual and moral in scope. Chapter 27 deals with vows and tithes.

LEWES (50° 52′ N., 0° 1′ E.), town, Sussex, England; ruined priory, dating from 1078; remains of ancient castle, built by William de Warenne, XI. cent. Here Simon de Montfort defeated Henry III., 1264. Pop. 1921, 10,798.

LEWES, GEORGE HENRY (1817-78), Eng. journalist and philosopher; abandoned medicine and the stage for encyclopædic study; pub. *Biographical History of Philosophy*, 1845-46; *Life of Goethe*, 1855; his best philosophical work was *Problems of Life and Mind*; although married, lived with George Eliot, 1854 till death; founded and edited *Fortnightly Review*, 1865-66.

LEWIS, CHARLTON MINER (1866-1923), American educator; *b.* Brooklyn, N. Y. He graduated at Yale in 1886 and entered on the practice of law in New York City in 1889. He became a member of the Yale teaching staff as instructor in English (1895-98), assistant professor of English language and literature (1898-99), and since the latter date has been Emily Sanford professor in that institution. His publications include *The Beginnings of English Literature*, 1900; *Gawayne and the Green Knight*, 1903; *The Principles of English Verse*, 1906; and *The Genesis of Hamlet*, 1907; He has also edited the Yale Series of Younger Poets and has contributed many articles to magazines.

LEWIS, SIR GEORGE CORNEWALL, Bart. (1806-63), Eng. politician and writer; Poor Law commissioner, 1839; sec., Board of Control, 1847; Under-Sec., Home Office, 1848; Financial Sec., Treasury, 1850; Chancellor of Exchequer, 1855; Home Sec., 1859; War Sec., 1861; among other works, wrote *Government of Dependencies*.

LEWIS, IDA (1841-1912), Amer. lighthouse-keeper, noted for her courage in saving life.

LEWIS, JAMES HAMILTON (1866) American legislator; *b.* Danville, Va. He was educated at Houghton College and the University of Virginia; was admitted to the bar in 1884 and entered on the practice of law at Seattle, Washington. He engaged in politics and was elected to Congress (1897-99). He served on the staff of Gen. F. D. Grant in the Spanish-American War and was a member of the Joint High Commission on Canadian and Alaskan boundaries. He removed to Chicago in 1903, and served as United States senator from that State (1913-19). His publications include *Two Great Republics, Rome and the United States*, 1913; and *History of International Law*.

LEWIS, MATTHEW GREGORY (1775-1818), Brit. dramatist and general writer, known as Monk Lewis from his romance, *Ambrose or the Monk*. Most of his work is now forgotten.

LEWIS, MERIWETHER (1774-1809); explorer and governor of Louisiana Territory; *b.* Charlottesville, Va.; *d.* Nashville, Tenn. His family was related to that of George Washington by

marriage, and he inherited ample means. In his youth he engaged in farming, which he abandoned in 1794 to join the forces raised by the government to suppress the so-called Whiskey Rebellion in western Pennsylvania. Afterwards he entered the regular army as an ensign and rose to captain. President Jefferson in 1801 made him his private secretary and two years later he headed a government exploring expedition with Captain William Clark into the virgin regions of the vast Louisiana territory of over 1,000,000 square miles, then about to be acquired from France by the United States. In 1804 the party followed the Missouri to headstreams, crossed the Rockies, entered the Columbia river, reached its sources, pursued its course to the Pacific, and reconnoitered much of the Oregon country. The party began their return journey from the Pacific in March, 1806, and did not reach Washington till February the following year. For his services the President appointed him Governor of Louisiana and Congress awarded a large tract of land out of the public domain. He died mysteriously in the cabin of a Tennessee pioneer, near Nashville, supposedly by his own hand.

LEWIS RIVER. See SNAKE RIVER.

LEWIS, ROBERT ELLSWORTH (1869), general secretary Y. M. C. A., *b.* at Berkshire, Vt., *s.* of C. P. Van Ness and Ellen R. Haynes Lewis. He was educated at the University of Vermont. He became general secretary Y. M. C. A., St. Johnsbury, Vt., in 1892 and after holding various other positions in connection with this organization, including secretary of the International Committee Y. M. C. A., Shanghai, China, 1898-1907, he became general secretary Cleveland, Ohio, in 1909. Author: *Educational Conquest of the Far East* and *Government Education in Japan.*

LEWIS, SINCLAIR (1885), an American author; *b.* at Sauk Center, Minn., *s.* of Dr. Edwin J. and Emma Kermott Lewis. He graduated from Yale University in 1907. After being a reporter for various newspapers and the Associated Press he was successively editor or assistant editor of Trans-Atlantic Tales; Volta Review; Frederick A. Stokes Co.; Adventure; Publishers' Newspaper Syndicate and editor George H. Doran Co. to 1916. Author (novels): *Our Mr. Wrenn*, 1914; *The Trail of the Hawk*, 1915; *The Innocents*, 1917; *Free Air*, 1919 and *Main Street*, 1920. *Babbitt*, 1922. He also wrote the play *Hobohemia* produced in New York in 1919 and contributed short stories to the Saturday Evening Post and other magazines.

LEWIS AND CLARK CENTENNIAL EXPOSITION, held in commemoration of the Lewis and Clark Expedition of 1803, in Portland, Oregon, in 1905. It was made the occasion of the first complete publication of the journals of the two famous explorers. See EXPOSITIONS.

LEWIS AND CLARK EXPEDITION. See LEWIS, MERIWETHER.

LEWIS MACHINE GUN. This gun is a gas-operated, magazine-fed, automatic rifle resembling to some extent the Hotchkiss gun. Motive power for the operation of the mechanism is obtained from the gas pressure produced in the barrel by the exploding cartridge. The gas is taken through a hole near the muzzle of the barrel into a cylinder under the barrel in which it drives a cylinder rearward. This directly produces the opening stroke of the action and by winding the spiral mainspring, stores the motive power to be used in the closing stroke. Air is used as a cooling agent by causing the muzzle blast of firing to suck cold air past radial fins surrounding the barrel. The magazine is a circular drum, holding 47 cartridges arranged radially, bullet ends toward the center. The magazine center has a deep spiral groove in which the bullet ends of the cartridges engage. The other parts of the magazine are rotated around the center during the operation of the gun, this driving the spirally arranged column of cartridges down the helical groove of the magazine center until they are successively reached by the feed operating arm.

The gun is usually sighted to 2100 yds. and weighs about 33 lbs. with mount and one full magazine. It was invented by Col., I. N. Lewis, U. S. A.

LEWISHAM (51° 31′ N., 0° 4′ W.), borough, London. Pop. 1921, 174,194.

LEWISOHN, ADOLPH, a capitalist; *b.* at Hamburg, Germany, where he was also educated. He came to America in 1869 and was afterwards head of the firm of Adolph Lewisohn & Sons; also president of the Tennessee Copper and Chemical Corporation, General Development Co., Miami Copper Co., South American Gold & Platinum Co. and Kerr Lake Mines, Ltd., and Vice president of the Utah Consolidated Mining Co., also director of the Importers & Traders National Bank. He made a number of gifts in the cause of education and philanthropy, including $300,000 for School of Mines Bldg. at Columbia University, and the Lewisohn Stadium at the College of the City of New York.

LEWISOHN, LUDWIG (1882), an

author; *b.* at Berlin, Germany, *s.* of Jaques and Minna Eloesser Lewisohn. He was brought to America in 1890 and was educated at the College of Charleston, S. C., and at Columbia University. He joined the editorial staff of Doubleday, Page & Co., in 1904 but left the following year and until 1910 was engaged in writing for magazines. He was then an instructor in German at the University of Wisconsin for one year and assistant professor of German language and literature at Ohio State University from 1911-19 after which he became associate editor of The Nation. Author: *The Drama and the Stage*, and *Upstream: An American Chronicle*, 1922. He also made several translations, was a lecturer on drama and poetry and contributed to various periodicals.

LEWIS-WITH-HARRIS (58° 10′ N. 6° 35′ W.), northernmost island, Outer Hebrides, Scotland; area, *c.* 770 sq. miles. Lewis, or N. part, is included in Ross-shire; Harris, or S. part, in Inverness-shire; chief town, Stornoway. Pop. *c.* 32,000.

LEWISTON, a city of Idaho, in Nez Perce co., of which it is the county seat. It is on the Northern Pacific and the Oregon-Washington Railroad and Navigation lines, and at the junction of the Snake and Clearwater river. It is the trade center for an important mining, agricultural and fruit growing region. Its industries include flour and box-making mills. Lewiston is the seat of the State Normal school and a U. S. Weather Bureau station. Its public buildings include a hospital and a public library. Pop. 1920, 6,574.

LEWISTON, a city of Maine, in Androscoggin co. It is on the Grand Trunk and the Maine Central railroads, and on the Androscoggin river, which is here spanned by several bridges. It is an important trade center for a large farming region. It has large cotton and woolen mills and plants for the making of boots and shoes, trunks, furniture, brick, etc. It is the seat of Bates College and Cobb Divinity School. It has a park, a library and other public buildings. Lewiston was founded in 1770 and was incorporated in 1795. It received its charter in 1861. Pop. 1920, 31,791.

LEWISTOWN, a city of Pennsylvania, in Mifflin co., of which it is the county seat. It is on the Pennsylvania railroad and the Juniata river. It is the chief trading center for an extensive agricultural and mining region and the industries include foundries, steel works, silk mills, hosiery mills, etc. It has a hospital and a public library. Pop. 1920, 9,859.

LEXICON. See Dictionary

LEXINGTON, a city of Kentucky, in Fayette co., of which it is the county seat. It is on the Cincinnati, New Orleans, and Texas Pacific, the Chesapeake and Ohio, and the Louisville and Nashville railroads. It is the chief industrial and social center of the famous blue grass region of Kentucky, and is notable for the breeding of fine horses. It also has important tobacco and hemp growing interests. Its industries include flour mills, planing mills, and plants for the making of saddlery harness, carriages and wagons. Lexington is the seat of Kentucky University, Transylvania University, State College, Hamilton College, and Sayre Institute. It is the seat also of a Protestant Infirmary, Colored Industrial Home and a hospital. The city is well laid out and has an excellent street system. Pop. 1920, 41,534.

LEXINGTON, a city of Massachusetts, in Middlesex co. It is on the Boston and Maine railroad, 12 miles west of Boston. It includes the villages of Lexington, East Lexington, and North Lexington. The principal industries are connected with farming, dairying and market gardening. There are high schools, a library and other public buildings. Lexington was settled in 1642 and was for a time known as Cambridge Farms. It was incorporated as a town in 1713. It is of great historical interest as being the scene of the first contact between the colonists and the British troops in the Revolution. Here, on April 19, 1775 an attachment of British soldiers from Boston fired on a body of colonists on Lexington Green. The British obtained primary advantage and destroyed the stores of the colonists, but were obliged to retreat to Boston and lost 275 men in killed and wounded. Pop. 1920, 6,350.

LEXINGTON, a city of Virginia, in Rockridge co. It is on the Baltimore and Ohio, the Chesapeake and Ohio railroads, and on the James River. Its chief industries are connected with agriculture and there are deposits of sulphur ore in the neighborhood. Lexington is the seat of Washington and Lee University and the Virginia Military School. Pop. about 5,000.

LEYDEN. See Leiden.

LEYDEN, JOHN (1775-1811), Scot. poet and Orientalist; *b.* Denholm, Roxburghshire, where a monument to his memory stands; friend of Sir Walter

Scott, and helped him in his *Minstrelsy*; some of his own compositions included; held governmental positions in India.

LEYDEN JAR or **CONDENSER**, electrical appliance for storing electricity' invented at Leiden; consists of glass jar coated inside and outside with tin foil and a metal knob connected by conductor with the inner coating; it is charged through the knob, and discharged by connecting the knob with outer coating; used in study of 'spark discharges' and 'electrical waves.'

LEYENDECKER, JOSEPH CHRISTIAN (1874), an artist; *b.* at Montabour, Germany, *s.* of Peter and Elizabeth Leydendecker. After being educated in public schools in Chicago he studied at the Art Institute of Chicago and at the Academie Julien, Paris. and in 1897 exhibited at the Salon Champ de Mars, Paris, however he was largely engaged in drawing for magazines. His brother *Frank X.* (1879) was also an eminent artist.

LEYGUES, GEORGES JEAN CLAUDE (1858), Fr. statesman, lawyer, and author; deputy for Lot-et Garonne for over twenty years; belongs to Radical party; has held various public offices, and was minister of marine (1917-20). Upon the election of M. Millerand as president of the republic (Sept. 1920) he became prime minister and minister of foreign affairs. His publications are chiefly on historical, political, and economic subjects.

LEYTON (51° 34′ N., 0° 1′ E.), town, Essex, England; suburb of London. Pop. 1921, 128,432.

LHASA, LHASSA (29° 39′ N., 91° 6′ E.), capital, Tibet; name means 'Abode of the Gods'; sacred city of Buddhists; situated on fertile plain about 11,900 ft. above sea-level; encircled by mountains. L. was visited by several R.C. missionaries in XVII. and XVIII. cent's; after 1760, Europeans were forbidden to enter city, but in 1904 it was occupied by force of Ind. army under General Macdonald and Colonel Younghusband, when a treaty establishing friendly relations was arranged. Town is laid out with comparative regularity, but is exceedingly dirty; principal building is the Potala, residence of Dalai Lama, a huge building with gilded roof, which stands on a hill to W. of city. The great temple or Jokhang stands in center of town and contains many sacred shrines, one of which holds life-size image of Buddha. The Ramo-Chhe is also a celebrated temple, where sorcery and magic are practiced and taught. L. has many monasteries, including those of Moru, Sera, Debung, and Galdan, last three of which were established by Tsonhava XIV. and XV. cent's. L. has important transit trade by meeting of caravans from India, China, and Turkestan trades in tea, silk, carpets, gold, lac gums, porcelain, musk, rice, tobacco Pop. 15,000 to 20,000.

L'HÔPITAL, MICHEL DE (*c.* 1505 73), Fr. politician; Chancellor of France 1560; approved edict of Romorantin 1560; opposed persecution of Protestants helped to procure edict reforming ad ministration of justice; discharged, 1568

LI, or **CASH**, the name of the copper coin of China, the only one made of that metal. It has in the middle a square hole, with an inscription on one side It is also a Chinese measure of length equal to about one-third English mile

LIABILITY. See EMPLOYERS' LIABILITY.

LIANA, or **LIANE** (Fr. *lier*, to bind) the name given generally to any climbing or twining plant which grows in tropical forests. A well-known example may be found in the genus *Smilax*.

LIAO - YANG or **LIAO - TUNG**, city of Manchuria, lies in the prov. of Shing-king, between Mukden and Port Arthur. It was the scene of a great Russian defeat in 1904, when it fell into the hands of the Japanese. Pop (estimated) 100,000.

LIAS, LYAS, LAYERS, lowest division Jurassic system; divided into three groups: (1) *upper* L., (2) *marlstone* (3) *lower* L.; consists of thin layers limestone embedded in blue argillaceous clay; contains numerous fossils, including insects, crinoids, ammonites, gryphites, fish, and plants. Remains of the pterodactyl and great reptiles such as ichthyosaurus, plesiosaurus, and enaliosaurus are found also. L. is exposed at Lyme Regis (900 ft. thick) and runs along Cotswolds to Bath (280 ft.), and is seen at Redcar, Yorks (500 ft.), and in N. Scotland, Ireland, and other localities.

LIBANIUS (*c.* 314-*c.* 392), a Greek sophist, *b.* at Antioch; lived and taught mainly in Constantinople, but also in Athens and Antioch. In religion he was a pagan, and supported the views and plans of the Emperor Julian with regard to the Christians but in private life he was mild and tolerant, and always maintained friendly relation towards St. Basil and St. Chrysostom, two of his pupils.

LIBAU, LIBAVA or **LEEPAJA**, trade port, and former naval station, Kurland

Latvia (56° 30′ N., 21° 1′ E.), 120 m. W.S.W. of Riga, on tongue of land between the sea and the lagoons (Libava Lake); terminus of several railways; port (on lake) almost ice free; lake connected with open sea by ship canal; exports grain, timber, flax, hemp, linseed, tar, turpentine, hair, meat, and skins; naval dockyards and meat-freezing establishment, and before World War had one of largest barbed-wire factories in Russia. Captured by Germans (May 7, 1915), who used it as a base of supply and strengthened it; also organized deep-sea fishing; transports and landing force for capture of Oesel, Moon, and Dago (Sept. 1917) were concentrated here. Pop. 1920, 51,583.

LIBEL AND SLANDER, defamation of character; libel—by writing, printing, or otherwise publishing in more or less permanent form; slander—by spoken word. Generally in case of slander special damage to person defamed must be proved, but not necessarily in case of libel. Publication—that is, the communication to some other person than the plaintiff—must be proved in either case. The plaintiff must also prove that the libel or slander was aimed at him personally, and a defamatory statement concerning any considerable class of persons can be uttered without let or hindrance. Disguise or omission of a name does not save the libeler if the plaintiff can satisfy a jury he is the person defamed.

LIBELLATICI, those who, during Decian persecution in 250, procured certificate stating they had sacrificed to the gods, to escape martyrdom.

LIBER PONTIFICALIS, work containing lives of popes from St. Peter; of composite authorship, probably begun in VI. cent.

LIBERAL PARTY, political party in Gt. Britain; successors of Whigs; name definitely adopted in Gladstone's time; original motto, 'Peace, Retrenchments, and Reform'; aimed at social progress and at bettering condition of lower classes; supported Free Trade, Irish Home Rule, and Welsh Disestablishment.

LIBERAL REPUBLICAN PARTY, political organization which had its origin in Missouri in 1870, and which first participated in a national election in 1872. It was composed chiefly of those Republicans who were dissatisfied with the personality and policies of General Grant (then President) and who were opposed to his renomination for the presidency in 1872. In January of that year its first national convention was held at Cincinnati, Ohio, with Carl Schurz presiding. The convention nominated Horace Greeley for President and B. Gratz Brown of Missouri as vice president, and adopted a platform vigorously condemning the Grant administration. The Democratic Party subsequently adopted the Liberal Republican candidates and platform, but at the polls in November the fusionists were badly defeated, Grant receiving 286 out of the 349 electoral votes. With this defeat the party passed out of existence.

LIBERIA, independent negro republic, W. Africa (5° 30′ N., 10° W.), extending S.E. of Sierra Leone for 350 m. along coast to Fr. Ivory Coast, and claiming the country for *c.* 150 m. inland. Liberia was established as a home for freed slaves in 1822 by a number of Amer. and European philanthropical societies. Boundaries were defined by treaties with Britain (1885) and France (1892 and 1907-10), by last of which a strip of territory was transferred to France; and in 1911 the Kanre-Lahun dist. was ceded to Sierra Leone. Coast is low and swampy; interior rises, and has excellent timber; watered by Cavally and other streams; soil very fertile; produces coffee, palm oil, and kernels, rubber, cocoa, ivory, sugar, arrowroot, piassava, hides, kola nuts. Cap. is Monrovia. Constitution resembles that of U.S.; executive power held by president, assisted by vice-president and cabinet of six ministers; legislature consists of two houses, senate and house of representatives. Owing to an unsatisfactory financial position an international loan of 1,700,000 dollars was agreed to (1912), secured by custom's rubber and head taxes, under administration of an Amer. controller and Brit. Fr., and Ger. sub-controllers. The inhabitants are all of negro race, and most of them profess Christian religion. Area, *c*, 40,000 sq. m.; Pop. 1,500,000-2,000,000. See MAP AFRICA.

LIBERTAD, LA LIBERTAD (*c.* 8° S., 78° 30′ W.), maritime department, Peru, S. America; area, 10,206 sq. miles; produces cereals, cotton, coffee, fruits, cocoa. Pop. 200,000.

LIBERTARIANISM, theory that the will is 'free.'

LIBERTINES, term of opprobrium, used specially by Calvin in reference to the Genevan Anabaptists; for origin of term, see *Acts* 6[9].

LIBERTY BELL. See BELL, LIBERTY.

LIBERTY CAP, or **CAP OF LIBERTY,** a cap used in ancient times as a symbol

of liberty. When slaves were given their freedom in Rome they were accustomed to assume the Phrygian cap as a token of liberty. The name was given to the red cap worn by the French Revolutionists.

LIBERTY LOANS, a series of popular loans raised by the United States after becoming a belligerent in the World War, and almost wholly subscribed by the American people. Five loans were raised between May, 1917, and April 1919. The first loan was for $2,000,000,000 at 3½ per cent interest, the bonds being both coupon and registered, and ranged in denomination from $50 to $100,000. They are redeemable after June 15, 1932, at par and accrued interest, at the government's option, and mature in thirty years, or on June 15, 1947. More than 4,000,000 persons contributed to the loan, which had an oversubscription of $3,035,226,850. The second loan, for $3,000,000 or more, at 4 per cent, raised in October, 1917, had similar terms and conditions, and yielded $4,617,532,300, an oversubscription of 54 per cent, from about 10,000,000 subscribers. The bonds are redeemable after May 15, 1927, and mature in 1947. The bonds could be converted into bonds of subsequent issues at a higher rate of interest. The third loan was issued for $3,000,000,000, at 4¼ per cent. interest in April, 1918, the government reserving the right to make allotments of any sum oversubscribed. It was a short term issue, maturing on September 28, 1928, and realized $4,176,516,850, the entire amount being allotted among the subscribers, who numbered 17,000,000. The fourth loan, which was for $6,000,000,000 also at 4¼ per cent, was offered in September 1918, and realized $6,989,047,000 from 21,000,000 subscribers. This loan matures in 1938, and the government has the option of redemption in 1933 or after. The fifth, or Victory Liberty Loan, was for $4,500,000,000 at 4¾ per cent and was offered in April, 1919. It consisted of short notes maturing in 1923, but with the privilege of redemption in three years from issue. The loan lagged at the start, popular ardor having abated with the World War's close in 1918, but in the end $6,000,000,000 was raised from 15,000,000 subscribers. Many of the holders of Victory bonds in 1922 elected to exchange them for U.S. Treasury bonds at 4¼ per cent, maturing in 1952 and redeemable at the government's option in or after 1947. The longer-term issues of the Liberty loans have certain tax exemptions.

The aggregate unredeemed amount of these bonds form a considerable portion of the United States public debt, in 1922 $22,691,276,000, and therefore entails a large annual interest charge.

LIBERTY MOTOR, a type of gasoline motor developed during 1917 and the early part of 1918 by American engineers for use in aeroplanes by the U.S. and allied armies. The design was the work of J. G. Vincent of The Packard Motor Car Co. and E. J. Hall of the Hall-Scott Motor Co. and was undertaken for the U.S. Government.

The idea actuating the development of this motor was not to design a new motor, but rather to so adapt various parts of successful engines that they could be produced quickly and in quantity. The success of this project was so great that a few months after the design was complete, nearly four thousand 400 H.P. motors were being turned out per month. The only serious difficulty experienced lay in the crank shafts of the first thousand motors manufactured. These were too light and the design was altered without appreciable delay.

These motors are being used to some extent at present in the aeronautical field, and modifications have appeared in various makes of automobiles and tractors.

The motor was of the twelve cylinder type, with 5″ x 7″ steel cylinders and pressed steel water jackets. These cylinders were assembled in a V-shape but the usual 60° angle was diminished to 45° in order to reduce stresses in the crank shaft and bearings. The cam shaft and valve mechanism was improved from the Mercedes design, while the cam shaft drive was taken from the Hall-Scott Motor, as was the piston design. The connecting rods were an adaption of the Cadillac and DeDion motors. The water pump was of the Packard type while the carburetor was developed from the Zenith design. A pressure lubrication system was used throughout similar to German practice.

LIBERTY PARTY, THE, American political organization composed of those who favored the abolition of slavery but thought that end could be attained gradually and by political means, in contrast with the views of Garrison and more vehement of his followers, who sought direct, immediate and drastic action. The first convention of the new party was held at Warsaw, N.Y. in 1839, and nominated James G. Birney for President. In the ensuing election in 1840, Birney received no electoral votes and his popular vote was only 7,069. Four years later Birney again ran as the standard bearer of the party and this time received 62,300 votes but

captured no electors. The vote however, though small, was enough to decide the election in favor of Polk over Clay, thus bringing about a result decidedly distasteful to the party. This was its last appearance as a party in the national arena, its constituency later supporting the Free Soil and still later the Republican nominees.

LIBERTY, STATUE OF, a bronze statue, the tallest in the world, erected on Bedloe or Liberty Island, New York City. It was presented by the citizens of France to the United States in 1878 but was not completed until ten years later. It was designed and executed by the French sculptor, Bartholdi. The statue is a female figure holding an uplifted torch. The statue is 112½ feet high and the pedestal 150 feet. The statue is illuminated at night and forms a landmark for ships entering the harbor.

LIBMANAN (*c.* 14° 5′ N., 123° E.), town, Luzon, Philippine Islands. Pop. *c.* 18,500.

LIBOURNE (44° 55′ N., 0° 11′ W.), town, Gironde, France; manufactures woolens; wine trade. Pop. 20,000.

LIBRA (the Balance), the seventh sign of the zodiac. In the older Greek writers the Scorpion occupies two constellations of the zodiac, or rather the body of the animal occupies one, and the claws, *chelae*, another. Though the chelæ were certainly a part of the Scorpion, yet they are often mentioned (as by Aratus, for instance) by themselves, as if they formed a distinct constellation. L. is surrounded by Scorpius, Ophiuchus, Virgo, Centaurus, and Lupus, and contains the well-known globular cluster Messier 5 which has as many as eighty-five short-period variables.

LIBRARIES. The earliest libraries of general reference were collected in Egypt and Assyria, and date from the remote period of 4000 B.C. In Assyria notable collections were those of Sargon I. in the city of Accad, and of Assur-banipal in Nineveh.

In Egypt the library of Alexandria, founded by Ptolemy Soter, was the noblest of anc. times. More than once it was plundered or partially injured by fire, and was at last utterly destroyed by the Saracens under the Caliph Omar, 642. Next to it is that of Pergamos, presented to Cleopatra by Mark Antony.

The first Roman library of note was that transferred to Rome as spoils of war by Æmilius Paulus in 168 B.C., and which had belonged to the kings of Macedonia. Augustus founded two libraries, known as the Palatine and the Octavian, and the practice was continued by later Roman emperors. Constantine founded a library of Christian authorities at the new Roman capital of Byzantium.

In the Middle Ages libraries were almost exclusively the property of the monasteries. Of the various orders that of St. Benedict was the most famous with regard to book-collecting. The best of the monastic collections of Europe were those of St. Gall in Germany, Monte Cassino in Italy, and Fleury in France.

But it was the Renaissance that gave the great incentive to the making of libraries. Italy took the lead. Niccolo Nicoli, in 1436, left his library as a legacy to the public. Following this precedent, Lorenzo de' Medici instituted his famous library. England, however, was slow to imitate the continental movement. In the 17th cent. many local libraries were founded, but no national institution was formed. Sir Thomas Bodley founded the Bodleian Library at Oxford, and at the same time Archbishop Usher started that of Trinity Coll., Dublin. In 1627 Drummond of Hawthornden presented Edinburgh Univ. with a fine collection of books, and in 1682 the Faculty of Advocates of the same city appointed Sir George Mackenzie to superintend the collecting of books for their library. Though the library of the univ. of Cambridge had been founded in the 15th cent., it was comparatively insignificant till George I. replenished it with a valuable contribution. Lambeth Library was founded in 1610, Sion College (a guild of London clergymen) in 1629, and about this period public libraries were founded in Leicester, Norwich, Bristol, and Manchester.

It was not, however, till middle of 19th cent. that circulating libraries were established generally in the larger cities of England, and the statistics of the period show that in this respect Britain fell far behind continental countries.

The Brit. Museum, the national library of Britain, is now the finest public library in the world. In 1753 Sir Hans Sloane offered his valuable collection of books and MSS. to the nation for the sum of $100,000. The conditions of the offer also stipulated that they should be kept in a special museum. Parliament accepted the offer, and also purchased a collection belonging to Robert Harley, Earl of Oxford. To house the collections, Montague House, of Bloomsbury, was purchased, and in 1759 opened as the Brit. Museum. To these collections were added the Cotton Collection, and the Royal Library of the Sovereigns of England (presented by George II.), along with which went the copyright privilege. In 1823 the splendid library of George III. was added. Other

important collections added were the Hamilton, 1772; the Cracherode, 1799; the Antiquities from Alexandria, 1867; the Towneley Marbles, etc. 1805-14; the Lansdowne MSS. 1807; the Phigalian Marbles, 1815; the Elgin Marbles, 1816; and the Burney Library, 1818. Anthony Panizzi was mainly responsible for the marvelous growth of the library; he secured from the government the annual grant of $50,000: he won the bequest of the priceless Grenville Collection, and planned the magnificent reading room.

Of the continental libraries the most famous is the Bibliothèque Nationale of Paris, which contains the collections of many Fr. monarchs, and was lavishly enriched with spoils after the Revolution. In 1862 an important edict enforced the establishment of a library in connection with all the primary schools of France. The Royal National Library of Germany is eclipsed in interest by the Royal Library of Munich. Famous libraries are those of Cracow, Graz, Budapest, and the Imperial Library of Vienna. Italy is noted for its ancient libraries—the finest are at Florence, Milan, Venice, Parma, and those of the universities of Bologna, Genoa, Naples, Pisa, and Turin. But the Vatican Library of Rome, the oldest in Europe, is unique—so rich is it in priceless MSS. and antique volumes. In Spain the chief national library is at Madrid. In Belgium there is a magnificent Bibliothèque Royale at Brussels. The chief libraries of Holland are at Amsterdam and the Hague. In Denmark the Royal Library of Copenhagen is open to the public. The best-equipped library of Sweden is at Stockholm. Before the World War there was a fine library at Petrograd.

In U.S. the establishment of public libraries was late. The oldest collections are at Harvard Univ. and at Yale Coll., New Haven. The largest Amer. library is the Library of Congress at Washington, the third largest in the world.

Practically every city of 5,000 population in the United States has a public library. This fact is due largely to the munificence of Andrew Carnegie who gave a library building to every city which meets his conditions. Some of the larger cities have great libraries, some provided by private benefaction and others maintained by public funds. The larger colleges and universities also have large and complete libraries. The New York Public Library, the John Crerar Library in Chicago, and the Boston Public Library are among the largest and best equipped in the world.

LIBRARY ASSOCIATION, AMERICAN, organization of American librarians founded at Philadelphia in 1876 with the design of promoting library interests in general, of bringing about necessary reforms and improvements and interchanging advice and experience. It came into special prominence during the World War because of its work in supplying books and periodicals to enlisted men both in American training camps and in actual service abroad. Over 2,400,000 books were sent overseas up to May 1919. In American training camps there were 1322 branches and station libraries. Following the close of the war, control of these activities was turned over to the national government. Recent developments of the work of the association have been the extension of libraries on American merchant ships; assistance attended to cities in the organization of public libraries, and a campaign drive for $2,000,000 for the purposes of the association. The official organ of the organization is the Library Journal, and in addition it publishes at intervals many pamphlets and bulletins. It has its headquarters in Chicago, Ill., and its membership in 1923 was about 6,000.

LIBRARY OF CONGRESS, at Washington, D.C., established by Act of Congress. It was destroyed by fire in 1814 and rehabilitated in the following year with the addition of ex-President Jefferson's library. In 1851 it was partly burned and Congress appropriated $75,000 for its reconstruction. In 1866 an agreement was made with the Smithsonian Institution (*q.v.*) to deposit its library there, and all future accessions. The Library of Congress is now the third greatest in the world being only surpassed by the National Library in Paris and the British Museum in London. It was originally planned as a library for legislators but has become a national institution for the whole people. In 1923 it contained over 3,000,000 printed books and pamphlets including the law library which is a division of the Library of Congress but remains at the Capitol. It contains an invaluable collection of manuscripts dealing with early American history, besides maps, charts, and works on genealogy, political science, law and legislation. The public have free use of the reference department, but only representatives and senators and some government officials may borrow books.

The present Library of Congress, the largest building for its purpose in the world was erected in 1897 at a cost of $7,000,000. The Librarian of Congress and the Superintendent of Buildings and Grounds are appointed by the President with the assent of the Senate. The Copyright Office is separate, though under the direction of the Librarian of

Congress and is in charge of the Register of Copyrights.

LIBRATION. This term is applied to a small irregularity, compounded of the moon's rotation round her axis and her orbital motion, by means of which her visible hemisphere is not always quite the same. The mean revolution of the moon round her axis is the same period of time as her mean revolution in her orbit. If both motions were equable, the moon would always present the same face to a spectator placed at the center of the earth, on condition that the plane of her equator passed through the center of the earth. None of these conditions being exactly fulfilled, and the variations being small and periodic, the consequence is that a small portion of the moon's surface in the eastern and western edges, and also in the northern and southern, is alternately visible and invisible. The maximum L. longitudinally is a little short of 6° 50′ and latitudinally is as much as 7° 53′.

LIBRETTO (diminutive of It. *libro*, a book), in music, in the book of words of an opera. Many cases, particularly in operas of the Italian school, where vocalization was carried to the highest pitch of perfection, the L. is entirely subordinated to and moulded by the exigencies of operatic art, and is often little more than doggerel. In the French school, where the declamatory principle was insisted upon, the national dramatic instinct has resulted in the production of dignified libretti, such as those of Lully's, Rameau's, and Gluck's operas. The L. has various characteristics which distinguish it from the ordinary drama, such as the use of the aria and the duet in place of dialogue.

LIBRIS, EX, see Book (*Bookplates*).

LIBYA, ancient Gk. name for N. Africa.

LICATA (37° 4′ N., 13° 57′ E.), port, Sicily; large export trade in sulphur; excellent harbor. Pop. 23,000.

LICE (Order *Anopleura*), small, wingless, externally parasitic insects, which infest mammals, piercing the skin by means of a hooked tube and sucking the blood. *Pediculus capitis*—the Head Louse—is found on the human head.

LICENSE. See Liquor Regulation.

LICENTIATE, name given to a person who is licensed in medicine; or among Presbyterians, those eligible to a pastoral charge.

LICHEN (*lichen ruber*), skin disease characterized by slight rise of temperature, with appearance of small red points close together, more or less all over the body.

LICHENS are, in reality, dual organisms resulting from the symbiotic union of one, or (rarely) more, species of green or blue-green alga, and certain species of the higher fungi (*q.v.*), which with the exception of the tropical form, *Cora pavonia*, are Ascomycetes. Very characteristic growths are thus produced, which form encrustations or tangled shaggy patches on rocks, trees, and similar substrata, and are extremely resistant. The fungal constituent derives its nourishment from the assimilatory products of the alga, supplying inorganic and possibly certain organic matter in return. In simplest cases the lichen thallus consists of a filamentous or gelatinous mass, which includes both symbionts (*e.g.* Ephebe, Collema), but the majority are more highly specialized, and, in these, the algæ (or *Gonidia*) occupy a definite layer enclosed and protected by a highly resistant cortical layer of closely interwoven fungal filaments. Such l's are said to be heteromerous, and fall into three series: (*a*) *Crustaceous* forms, in which the thallus is closely adpressed to the substratum, to which it is normally intimately attached; (*b*) *Foliaceous* forms, in which the main body of the lichen is lobate and free being attached to the substratum ventrally by a mass of root-like growths termed rhizines; (*c*) *Fruticose* forms, in which the thallus is attached by the base only, and often branches freely, and possesses a ribbon or tree-like form.

LICHFIELD (52° 42′ N., 1° 50′ W.), town, Staffordshire, England; episcopal see, founded by St. Chad, VII. cent.; cathedral dates from XIII. cent., and was restored after Civil War; episcopal palace, grammar school; birthplace of Dr. Johnson; chief industry, brewing. Pop. 1921, 8,394.

LICHNOWSKY, KARL MAX, PRINCE (1860), Ger. ambassador at the court of St. James, 1912-14; at outbreak of war left London; went into retirement and wrote an account of his 'mission to London'; privately circulated; extracts from it appeared in a Swedish newspaper, March, 1918; shortly afterwards pub. in book form. In it he brings the following charges against Germany: (1) The Germans encouraged the Austrians to attack Serbia. (2) Between the 23rd and 30th July 1914, when the Russians announced that they would not tolerate an attack on Serbia, the Germans refused to help Britain to work for peace, although Serbia was prepared to accept the whole of the 'Note,' and the Austrians were prepared to content themselves with the Serbian reply. (3) On July 30, when Austrians wished to come to terms, the Germans ordered Russia to demobilize.

though Austria had not been attacked; and on Aug. 1 they declared war against Russia, although the Czar pledged himself not to order a man to march while the matters in dispute were being discussed. Thus the Germans 'deliberately destroyed the chance of a peaceful settlement.' The book made a great sensation abroad, and provoked consternation in Germany. Ludendorff (*My Memories*) says that he urged the Chancellor to take proceedings against Lichnowsky.

LICINIUS (250-324), Rom. emperor, 307, jointly with Galerius; jointly with Maximinus, against whom he rebelled, 313, becoming master of the East; conquered and deposed by Constantine, 323.

LICK, JAMES (1796-1876), American manufacturer and philanthropist; *b.* Fredericksburg, Pa. He established a pianoforte business at New York in 1821, and later maintained branches in Philadelphia and various cities in South America. He removed to California in 1847 and added to his already large fortune by investments in real estate and other enterprises. He established a trust fund in 1874, two years before his death, by which he devised $3,000,000 to various civic enterprises of San Francisco, such as public baths, schools and memorials, excepting the amount of $700,000, which was given to the University of Southern California for the construction of an observatory and the placing therein of a telescope to be more powerful than any other in existence. It is this latter bequest which has served chiefly to perpetuate his name.

LICK OBSERVATORY. In 1874-75, James Lick of San Francisco (1796-1876) conveyed deeds to the value of $700,000 to trustees to buy land, build an observatory and construct the largest telescope yet made. On the summit of Mount Hamilton 26 miles from San Francisco, 3000 acres were purchased, and building began in 1880 from plans by Edward S. Holden the first director. A refractory telescope is the principal instrument of the observatory. The glass disks were founded by Feil and Mantois, Paris, and figured by Alvin G. Clark. The completed objective is 36 inches in diameter, focal length 56 ft. 2 inches. Cost of the observatory $610,000. It is now the Lick Astronomical Department of the University of California. A series of 'Contributions' and 'Publications' have been issued by the observatory authorities since 1901 and a 'Bulletin' describing the work there. Visitors are admitted to the observatory in the day-time, and on Saturday evenings may look through th great telescope.

LICTORS (Lat. *ligo*, to bind, probabl with reference to the bound rods c fasces borne by them), civil officer amongst the ancient Romans, who wer required to attend before the consuls d magistrates to clear the way. It was als their business to inflict corporal punish ment and to perform executions.

LIDDELL, HENRY GEORGE (1811 98), famous as the collaborator, wit Dean Scott, of the Greek Lexicon From 1846-55 he was headmaster o Westminster School; dean of Chris Church, 1855-91; and vice-chancellor a Oxford, 1870-74. Besides the valuabl Lexicon, he wrote a *History of Rom* 1855.

LIDDESDALE (55° 15′ N., 2° 45′ W.) district drained by Liddel, Roxburgh shire, Scotland; contains Hermitag Castle, which has associations wit Mary Stuart and Bothwell.

LIDDON, HENRY PARRY (1829-90 Eng. theologian; Ireland prof. of Exeg sis at Oxford, 1870-82, and from 187 Canon of St. Paul's.

LIE, JONAS LAURITZ EDEMI (1833-1908), Norwegian novelist; bor Eker, Norway. He was educated a the University of Christiania, settled a a lawyer in 1859 at Kongsvinger, bu abandoned that profession in 1868 t devote himself to journalism and litera ture. He achieved a great and imm diate reputation by the publication o his novel, *The Visionary*, in 1870. Th next twenty years he spent largely i travel, not however intermitting h literary output, and returned to Norwa in 1892. His publications includ *The Pilot and His Wife*, 1874; *Life Slaves*, 1883; *The Gulf*, 1885; *Two Live* 1887; *Grandfather*, 1895; and *Wulff and Co.* 1901. In addition he wrote number of poems and dramas. H works have been translated into man European languages, and he is regarde as one of the most able literary men tha Norway has produced.

LIEBER, FRANCIS (1800-72), Ame author and historian of Ger. birt fought at Waterloo; settled in U.S. 182

LIEBIG, JUSTUS VON, BARO (1803-73), Ger. chemist; prof. of Chem at Giessen, 1824-52; at Munich, 1852-7 laid the foundations of ultimate organ analysis; invented potash bulbs and condenser; showed fulminic acid is meric with cyanic acid, 1823; pub., wi Wöhler, *Researches on the Radicle Benzoic Acid*, 1832, and with Dumas, memoir on polybasic acids, 1838; ma

valuable contributions to the chem. of agriculture and physiology, and established by analysis the nutritive values of foods; a well-known extract of beef is prepared from his prescription.

LIEBKNECHT, KARL (1871-1919), Ger. Socialist; son of Wilhelm Liebknecht, 1826-1900, one of the founders of the Ger. Socialist party; entered lower house of Prussian Diet, 1908; member of Reichstag for Potsdam, 1912; violently opposed to Ger. war party; revealed Krupp bribery scandals, 1913; called to colors, 1915, and served in labor battalion on W. front; during leave appeared in Reichstag and made scenes; was practically expelled from Socialist party and from Reichstag, April 1916; became leader with Rosa Luxemburg of Spartacus party; said to have taken Russian money for his movement; was prominent in Ger. revolution; killed under obscure circumstances.

LIEBKNECHT, WILHELM (1826-1900), Ger. Socialist; led Baden rebellion, 1848; imprisoned; subsequently escaped to France; returned to Germany, 1862; founded *Demokratisches Wochenblatt*; imprisoned, 1872-74; entered Reichstag, 1874; edited *Vorwarts*, Socialist paper.

LIECHTENSTEIN, PRINCIPALITY OF, small independent state, Austria (47° 7′ N., 9° 33′ E.), bounded on N. and E. by Vorarlberg, on W. by Rhine, and on S. by Swiss cantons of Grisons and St. Gall; extremely mountainous (Rhætian Alps); corn, vines, fruits, flax. Chief town, Vaduz. From 1866 belonged to the Austrian customs union; people pay no taxes and are not liable for military service. Area, 65 sq. m.; pop. 10,000.

LIÉGE, town, episc. see, Liége prov., Belgium (50° 32′ N., 5° 30′ E.), on riv. Meuse, 55 m. S.E. of Brussels, 10 m. from former Ger. border; old town on hills overlooking Meuse on l. bk.; new town down below on r. bk.; fine city, handsome squares, bridges, and churches. At opening of World War was defended by twelve detached forts, from 4 to 6 m. distant, constructed of concrete with armored domed turrets, and equipped with modern heavy guns. Cathedral founded 712, destroyed 1794; since then St. Paul's, 968-1528, has been church of see; St. Denis and Holy Cross date from the 10th cent. Bishop's palace and Palais de Justice, 1508-40; restored 1848-56, are architecturally notable. Univ. founded 1817 has school of mining. Liége in center of Belgium coal-mining district; one of first manufacturing cities of country; the Belgian Birmingham; firearms, cannon, hardware, zinc, cycles, machinery, watches, linen, woolens, etc. Its collieries include some of the deepest sunk shafts in the world. Pop. with suburbs, 250,000.

Siege of Liege.—First serious conflict of World War took place around Liége. By the evening of Aug. 4, 1914, the Germans, who hoped to capture it by a *coup de main*, were closing in on the ring of forts surrounding the city. The attacking force consisted of three divisions, under General von Emmich; the city was defended by about 20,000 men, under General Leman. On Aug. 5, Fléron, chief fort on S.E., was silenced; on Aug. 6-7 other forts fell, and the city was entered; on Aug. 13-15 the remaining forts to N. of the city were demolished. On Aug. 7 the 'fall of Liége' was announced, to the frenzied delight of the Germans, though on the 14th most of the W. forts were still intact. During the bombardment by heavy siege artillery (secret until then), shells crashed through 12 ft. of concrete and reduced the forts to shapeless masses. The cannonading did little damage to the city itself. It is generally conceded that the stubborn resistance of the Belgians at Liége delayed the main Ger. advance for nearly a week. The Fr. government invested the city with the Legion of Honor. Much of the machinery in small-arms factories was subsequently removed to Germany, as the Belgian workmen refused to construct weapons for use against Allies.

LIEGNITZ (51° 12′ N., 16° 9′ E.), town, Pruss. Silesia, Germany; old ducal palace; manufactures machinery, textiles, etc. Here Frederick II. defeated Austrians, 1760. Pop. 1919, 70,337.

LIEN, the right to retain property belonging to another until certain demands of the person in possession of the property have been satisfied. A *particular* l. arises out of the actual property retained, and is caused either by a definite contract, or by an implied contract. A *general* l. is given by indebtedness on other accounts. As a l. is only valid when the person through whom it is acquired has the absolute right of ownership, so it can only be enforced by the person to whom it is due in his own right, and not by an agent. It may be waived or lost by an act of agreement between the parties, by which it is surrendered, or made inapplicable; and it has been held that it may be lost by the temporary relinquishing of possession.

LIERRE (51° 8′ N., 4° 34′ E.), town, Belgium. Pop. 25,000.

LIESTAL (47° 29′ N., 7° 44′ E.), town, near Basel, Switzerland. Pop. 6,000.

LIEUTENANT (Fr. from Lat. *locum*

tenens, holder of place, substitute), representative; especially applied to officer below captain in rank in army and navy; l. in navy has rank of army captain; l.-general and l.-colonel are deputies of general and colonel; lord l. of a county, Crown gov.; **Lord L.** of Ireland, viceroy.

LIFE. See EVOLUTION.

LIFEBOAT. See LIFE-SAVING APPARATUS.

LIFE INSURANCE. See INSURANCE.

LIFE-SAVING APPARATUS, term including all appliances for saving life, but generally applied to life-belts, life-jackets, and boats by which one may escape from a ship at sea. Life-jackets and buoys are made of cork, sewn in canvas, and enable wearer to float with ease. Cargo steamers generally carry sufficient boats for all; but in large passenger vessels this is almost impossible. Boats have enclosed buoyancy either in form of airtight, watertight copper cylinders, or externally fitting cork fenders, or with the buoyancy carried under a deck. Each boat must be fully equipped with oars, rudder, etc. (and in certain cases with mast and sail), and with fresh water. while provisions and self-igniting lights are sometimes carried. Cork mattresses, which support three or four men, and life-rafts, consisting of hollow metal or inflated rubber floats supporting a wooden deck, are other life-saving appliances.

For life-saving from shore the *rocket apparatus* is almost invaluable. A rocket is fired carrying a line over the vessel, and this enables those on shore to send out a hawser and then to work to and fro a sling buoy, sufficient to carry a person to the shore.

Lifeboats are boats of great strength, made very stable by a heavy keel, buoyant by a watertight deck and air chambers, self-emptying and self-righting. Institutions, supported by the state or by voluntary subscription, provide and maintain lifeboats round the coasts of U.S., France, Germany, and Great Britain.

LIFE SAVING, THE UNITED STATES COAST GUARD, By act of Congress passed January 28, 1915 the revenue-cutter service and life saving service were combined. The revenue-cutter service was established in 1790 to enforce custom laws and for protection of the coasts. The Life Saving Service dates from 1848 and by enactment was systematized with the Revenue Cutter Service until June 1878 when Congress divided them, the Cutters working on the seas, and the life savers ashore. In June 1922 the Coast Guard numbered 3,548 petty officers and enlisted men, a 421 temporary and substitutes. Th receive the same pay as correspondi grades in the U.S.N. Persons save 2,954, 1922. Assistance furnished p sons on vessels, 14,531. Derelicts d troyed, or towed to safety, 48. Val of property saved, $380,550. Appr priations for the year for repairi cutters, $360,000. For maintenan $9,811,857.50. Until 1913 nothing w done to provide ice-guards, when t American cruisers were assigned to th duty. In January, 1914, at a conventi held in London, representatives of t chief maritime powers mutually agre to provide guard ships for ice observ tion, etc. Floating equipment, 103 all classes, 77 in commission. Sea, lak and coasts, are divided into 13 district Active stations, 235. Inactive, 42. T entire service is under the direction the Secretary of the Treasury.

LIFFORD (54° 50′ N., 7° 29′ W. town, County Donegal, Ireland.

LIGAMENT, anything which t one thing to another; in anat., a ba of tissue connecting the bones formi a joint, or holding an organ in pla usually composed of parallel or int lacing fibres of flexible, dense, whit fibrous tissue.

LIGAO (13° N., 123° 50′ E.), tow Luzon, Philippine Islands. Pop. 18,00

LIGGETT, HUNTER (1857), Am army officer; *b.* Reading, Pa. graduated at the United States Milita Academy in 1879, entered the service second lieutenant in the same year a rose through the various grades un he was made major-general in 191 He served with distinction in t Spanish-American war in Cuba and la in the Philippines. In the World w he became a figure of military i portance second only to General Per ing. He commanded the 41st Divisi of the A.E.F. from Sept. 1917 to Ja 1918; was head of the First Army Co from Jan. to Oct. 1918, and was li tenant-general of the First Army fr October 15, 1918 until the signing of t armistice, Nov. 11, 1918. In 1919 commanded the 3rd Army of Occupati on the Rhine. He did conspicuous a brilliant work in the St. Mihiel a Argonne-Meuse campaigns. He reti from active service in 1921 with the ra of major-general.

LIGHT is that branch of science wh deals with the external cause of visual sensations. It is also known Optics, and is frequently divided i such sections as *Geometrical Opti Physical Optics*, and (although beyo

the present scope) *Physiological Optics*. The first of these deals with the transmission, reflection, and refraction of light rays, without inquiring into their physical nature. The second explains all phenomena relating to light on the theory that it is due to a periodic displacement or wave motion in a luminiferous medium. The third includes the study of anatomy of the human eye and the physiological factors relating to human vision.

Previous to the beginning of the 19th cent., several theories had been propounded to account for the nature of light and its propagation, but the two principal explanations offered were those known as the *Corpuscular Theory* and the *Undulatory* or *Wave Theory*. According to the former, the sensation of light was excited by the impact on the retina of a large number of minute particles, or corpuscles, emitted in large numbers by the source of light and traveling through transparent substances, as well as vacuous space, with great speed. Apart from inherent improbabilities, there were fatal objections to this theory—(*e.g.*) the speed of light should, according to it, be greater in a denser medium, whereas Foucault showed experimentally that the reverse is the case. The theory encounters serious difficulties in attempting to explain *interference*, *diffraction* (*i.e.*, the bending of light rays round the edge of a narrow slit and the formation of alternate light and dark bands bordering the image on a screen), and polarization.

The undulatory theory supposes that light consists of wave motion in a medium filling all space, including intramolecular space, and that the vibrations are perpendicular to the direction of the ray. At first this theory required the assumption of a medium possessing density and elasticity; but the almost universal belief now is that light is an electric phenomenon, the vibrations being electric and magnetic displacements. This theory, which we owe to the genius of Maxwell, led to a new conception of the meaning of time; and this, again, has recently, in the hands of Einstein, played an important part in the development of the theory of Relativity. One striking result of Einstein's doctrine is that a ray of light otherwise straight suffers deflection in the neighborhood of a large gravitating body like the sun. On May 29, 1919 astronomers photographed the heavens in the neighborhood of the sun during a total eclipse and obtained measurements of star positions which verified Einstein's prediction. Further confirmation was given in 1923 from the results of photographing the total eclipse of the sun in 1922.

Accepting the undulatory theory, we may briefly summarize the leading points in the science by considering the essential characteristics of a ray of light, and, to begin with, we confine ourselves to monochromatic light. Any wave which is propagated in a medium has three principal features (see WAVE). It must have (1) a certain *wave-length*, just as regular waves in the ocean have a length measured from crest to crest; (2) a certain *period*—(*i.e.*), the time taken by any portion of the medium affected by the wave to describe one complete vibration; (3) a certain *amplitude*—(*i.e.*), the displacement, elastic or electric (according to the view taken), as measured from the position of equilibrium. The wave-length of light which is ordinarily appreciable by the human eye varies from $\frac{1}{2500}$ to $\frac{1}{1540}$ millimetre. The former (*i.e.*, the shorter) waves belong to violet-colored light. As the wave-length increases we have, by indefinitely minute gradations, blue, green, and orange light, until for the longer wave-length mentioned we have red light. This range does not, however, exhaust all possible wave-lengths, for the existence of waves which are either too short or too long to affect the retina has been fully proved.

The amplitude of a light wave is the factor which governs the intensity of the ray, for with light of a given wave-length the energy in the ray is proportional to the square of the amplitude.

The speed of light in space is 186,330 m. per second, and is the same for all wave-lengths. In transparent matter, the velocity of light is reduced and varies with the wave-length. The simplest properties of undulatory motion explain important phenomena which arise when rays from two separate sources meet at a point. Analagous cases are found in ocean waves, in sound, and in the phenomena of the tides. If, owing to any cause, two series of waves from different sources meet on the same water surface, there may occur the case where crests of waves in one series unite with crests of the other series. The resultant wave has then an amplitude equal to the sum of the component amplitudes. But where the crests of one series meet the troughs of the other, the resultant amplitude is the difference of the component amplitudes, and if these are equal there is no disturbance of the sealevel. Similarly, it is possible to produce a combination of rays which will give either increased or diminished brightness. This is known as *interference*.

Another group of phenomena is due to the possibility of the vibrations in the ether being confined to one particular

plane. The light is then said to be *plane polarized*. Plane polarized light is best obtained from Iceland spar, which has the property of double refraction—that is, of dividing any transmitted ray of ordinary light into two rays, each of which is polarized. The explanation of double refraction is one of the triumphs of the wave theory. Further, since harmonic motions in different directions combine to produce circular or elliptic motion, we can combine polarized rays in a similar manner. As long as a ray travels in the same homogeneous medium, it does so in a straight line; but when it arrives at the surface of separation between two media which are optically different, a change takes place. One portion of the ray may be thrown backwards into the medium in which it has been traveling, and is thereby *reflected*. Another part may be scattered in a diffuse or irregular manner, and it is by this diffusive reflection thatwe see most objects which are not self-luminous. A third part, passing into the second medium, may have its direction abruptly changed, and is said to be *refracted*. Lastly, a certain portion may be absorbed by the second medium and its energy transformed into heat. At present the line of advance in physical optics is towards a satisfactory explanation as to how luminous matter transfers energy to the ether so as to produce vibratory motion. The most promising explanation is that associated with each atom (or perhaps constituting each atom) there are electrically charged particles or electrons, whose mass is mostly, if not wholly, electromagnetic, and whose motions give rise to ether waves.

What is known as *aberration of light* in optical instruments means the deviation of part of a pencil of rays from the theoretical focus. It is of two kinds, spherical and chromatic. The subject is further treated under LENS.

LIGHT CURE, use of ultra-violet rays in such diseases as lupus, favus, etc.

LIGHTFOOT, JOHN (1602-75), Eng. theologian; ed. at Cambridge; member of Westminster Assembly, 1642-44; best known as Hebrew and Rabbinical scholar; his greatest work was *Horae Hebraicae et Talmudicae.*

LIGHTFOOT, JOSEPH BARBER (1828-89), Anglican divine; ed. at Cambridge, where he attained high honors; Hulsean prof. of Divinity, 1861; bp. of Durham, 1879.

LIGHTHOUSE, a building erected on some conspicuous part of the coast to warn and guide ships. The earliest form was a simple tower with a beacon fire.

Lighthouses may be situated on the land, or on rocks or shoals swept by the sea. Those on land are ordinary architectural buildings, and their construction does not call for special notice. There are various methods of constructing lighthouses on rocks or shoals. If the rock affords a good foundation, a tower of masonry is usually the most convenient, such towers being constructed on the lines of Smeaton's Eddystone lighthouse, with certain modifications. The circular form is adopted as offering least resistance to wind and water, and the center of gravity is kept low. The lowest parts of the structure, which have to withstand the full shock of the waves, are built with a vertical face. The height of the tower depends upon the work it has to do, but it must always be sufficient to keep the light unobscured by spray.

Lights may be divided into two classes, fixed and flashing. Fixed or continuous lights are used for harbor lights, but seldom for other purposes. Flashing lights may show a single flash, or a group of two or more flashes, but in every case the periods of darkness are greater than those of the light. Fixed lights are often arranged so as to be entirely eclipsed at regular intervals, and they are then called occulting lights. Such lights may have groups of two or more occultations, and they are distinguished from flashing lights by having the light period greater than, or at least equal to, the period of darkness. There are also alternating lights, showing different colors with dark period between, but these are not very satisfactory. White, green, and red are the colors generally used; white is the most efficient.

Where a light is required to show the channel between sandbanks or other dangers, it is divided into sectors, white and colored. White light is thrown on the fairway, and colored light on the dangerous places. The apparatus employed in flashing and occulting lights is usually rotated by weight-driven clockwork mechanism, which automatically indicates when rewinding is required. Spring-driven clockwork is also used for occulting lights.

Smeaton's Eddystone light consisted of twenty-four candles. Oil, coal or acetylene gas, and electricity are now used. The use of gas or electricity generally necessitates the construction of special generating plant, and on this account oil is much the simplest and most convenient illuminant, but its efficiency is lower than that of either electricity or gas.

The optical instruments used in lighthouses may be divided into three

classes—catoptric, dioptric, and catadioptric. In *catoptric* instruments the rays of light are reflected by plane, parabolic, spherical, or other mirrors. In the *dioptric* arrangement the rays are not reflected, but pass through the glass, being thus twice refracted. *Catadioptric* instruments combine both these methods. Besides the ordinary lighthouses with keepers, there are numerous unattended lights and beacons. The source of light for these is often oil gas, stored at a pressure of several atmospheres. Acetylene gas is also used to some extent.

Lightships are largely employed in places where it is not possible to construct a lighthouse.

LIGHTING.—One of the earliest methods of obtaining artificial light was that of burning oil. The oils in use up to the mid.-XIX. cent. were principally of animal or vegetable origin, mineral oils being brought into use for lighting purposes about 1853. Early lamps, which consisted of a shallow, containing-vessel and a short wick dipping into the oil, were very unsatisfactory, for they gave off unpleasant vapors, and the flame was smoky. The first real improvement in construction was made in 1784, when the *Argand lamp* was introduced. In this lamp a cylindrical wick was placed between two concentric metallic tubes, the combustion of the oil being made more complete by a constant stream of air passing through the inner tube to the flame, and by an additional draught, got by placing round the burner a glass chimney resting on a perforated base. The flame in this lamp varied with the level of the oil in the reservoir, and in the *Carcel* lamp, invented about 1800, this defect was remedied by a clockwork arrangement, which kept the burner supplied with an abundant supply of oil. The Carcel lamp is still used to a small extent in France. The *moderator lamp*, invented about 1836, is based upon the Carcel lamp, the oil being forced through a tube to the burner by the pressure of a spring upon a disc floating in the oil. In the tube is placed a tapering rod called the moderator, which regulates the flow of oil in accordance with the pressure of the spring. The above-mentioned lamps were only suitable for vegetable or animal oils, for the principle of forcing a superabundance of oil to the burner cannot be applied in the burning of petroleum, paraffin, or other mineral oils. In lamps intended for mineral oil, only as much oil as the wick is able to suck up reaches the burner, in order to prevent smoke, and a constant and abundant supply of air is provided. Petroleum may be burned in the ordinary way, or may be vaporized and used in conjunction with an incandescent mantle.

When *coal gas* was first tried as an illuminant it was burned as it issued from an open iron tube, but this was soon found to be unsatisfactory, as a large quantity of gas was consumed for a small amount of light. The end of the tube was then closed up, and three small holes bored in it, giving three small jets. Various arrangements of holes and sawcuts followed, leading up to the fishtail burner, in which two holes are bored at such an angle as to give two jets impinging upon one another, and producing a flat flame. In the regenerative burner the heat of the flame is used to raise the temperature of the air supply.

Incandescent gas lighting rose from the fact that if certain incombustible substances were raised to a high temperature a brilliant light was produced. Platinum mantles were first tried, but their illuminating power decreased rapidly, owing to the erosive action of the gases in the flame. The discovery of the *Bunsen burner* about 1855, in which a non-luminous flame is obtained by mixing the coal gas, before combustion, with a certain proportion of air, paved the way to the modern incandescent burner. Welsbach hit upon the idea of a mantle consisting of a cotton fabric soaked in a solution of a metallic salt, and took out his first patent in 1805, but the *Welsbach mantle* was not perfected until 1893. Various methods of increasing the efficiency of the incandescent light have been introduced such as supplying the gas or the air, or both, at a high pressure, or producing suction upon the gas and air by means of a special form of chimney used in combination with a burner adapted to utilize the augmented supply. The shape of the ordinary type of mantle is such that the light is given off at an angle above the horizontal, and this is a drawback for most domestic purposes, in which the light is required chiefly below the level of the mantle. This defect is remedied in the *inverted type* of mantle, which was introduced about 1900.

In 1801 Sir Humphry Davy discovered that if two carbon rods were connected with the terminals of a powerful battery, and the points of these rods first brought into contact, and then slightly separated, the current did not cease, but continued to cross the gap, producing what is called the electric arc. This discovery led to the construction of the *arc lamp*, the first practical means of employing the electric current for purposes of illumination. The carbon points in the arc lamp become incandescent, and the intervening space is

filled with incandescent particles of carbon. The temperature of the electric arc is very much higher than that of an ordinary flame, and therefore its light has a higher efficiency.

LIGHTING SYSTEMS. The production of artificial light depends, at the present time, upon raising some substance to such a temperature that it becomes incandescent. Any solid body at a higher temperature than the atmosphere surrounding it emits radiations. At low temperatures, the radiations are of a kind which are not perceptible to the eye. In scientific language, the radiations are of greater wave length than red light. As the temperature of the body is raised, however, the radiations become perceptible as red light, and at still higher temperatures the amount of red light increases, and at the same time yellow, green and blue light are added. At very high temperatures, ultra-violet light (light of very short wave length) is produced. The problem of economical lighting resolves itself, therefore, into raising the temperature of a body to such a degree that the radiations it emits will contain as large a proportion as possible of rays perceptible to the eye. In the ordinary candle or oil lamp, small particles of carbon, produced by the decomposition of the wax oil, are raised to incandescence and so cause the flame to be luminous. Similar causes produce the luminosity of the gas flame, while incandescent gas light depends upon raising a network of mineral earths to a high temperature in a Bunsen flame. *Modern lighting systems* almost always make use of some form of gas or electricity, although oil lamps are of common occurrence in rural districts, while candles are still used for their decorative effect. Oils have been used in lamps from time immemorial, but until the middle of the 19th century colza, sperm and other animal and vegetable oils were used. The discovery of vast supplies of petroleum in the United States about the year 1850 made the use of kerosene practically universal. Until the year 1874, open wick lamps were used, but in that year Argand invented a burner consisting of two concentric tubes, between which he placed the wick, at the same time surrounding it with a glass chimney. The modern oil lamp is merely an improved form of Argand's burner. Coal gas was first used as an illuminant in 1779, but it was many years later before its use became general. The early gas burners were of the batswing and fishtail type, and it was not until 1885 that the Welsbach mantle was produced. Later improvements were provided by the introduction of t inverted burner. Electric lighting of two kinds—arc and incandesce Arc lights depend upon the product of an arc between two carbon ro The rods are first placed in cont and an electric current passed throu them. They are then drawn apart, a by the discharge across the gap a stre of incandescent vapor is produc The first successful incandescent lan were produced by Edison and Sw and consisted of a filament of carb enclosed in a glass globe containin vacuum. In the modern lamps, tungs wire takes the place of carbon, but each case illumination depends upon raising of the wire, by the passage the current, to a temperature of inc descence. Lighting systems of the fut will undoubtedly depend upon c light. The problem of producing li without heat has engaged the attent of scientists for many years, and appears that it will be solved in the n future. Newton Harvey of Prince announced, in 1922, the isolation *luciferin*, the substance producing glow of fireflies. If luciferin can artificially produced in large quanti a source of cold light will be availa Emile Risler of Strassbourg in 19 described a new form of light made coating a glass tube with a phosph escent substance, and passing throug an electric current. The amount of h produced by the current is said to inconsiderable, while the light is dazzli

LIGHTNING. See METEOROLOGY (ATMOSPHERIC ELECTRICITY).

LIGHTNING CONDUCTOR, LIGHTNING ROD, consists of a bro band of copper or iron, fixed to outside of a building in the most dir manner possible. One end is bur in wet earth, and the other runs t point (or set of points) projecting abo the structure. Primarily it preve accumulation of electricity in vicini but if this is very rapid, it offers an e passage to the discharge, thus saving building.

LIGHTS, CEREMONIAL USE among Christians was partly taken o from Jewish and pagan antiquity, par in the symbolism of light which inevi bly grew up. Light has been sacred many religions, but Christian servi were often held at night, and lights w not used ceremonially till the III. ce Tertullian and Lactantius denou lights in the daytime as foolish. By t IV. cent., however, the custom w universal. But lights were not at fi placed on or behind the high alt but carried, as they are now in t

Eastern Church. In the Rom. ritual, lights symbolize the presence of God, terrify the powers of darkness, or are votive offerings. The Sanctus candle symbolizes the presence of Christ. In Passion Week 13 lights are gradually extinguished—the ceremony known as *Tenebrae*. New fire is made in Jerusalem at Easter Eve and also in the Rom. Church. Among Protestants lights have been abolished, except in Lutheran churches, where they are still retained. The Anglican Church has retained the use of lights intermittently; two candles on the altar were ordered by the First Prayer Book of Edward VI.; they were revived in the XVII. and again with the Oxford movement in the XVIII. cent.; the question of their legality is disputed.

LIGNE, CHARLES JOSEPH, PRINCE DE (1735-1814), Belg. soldier; fought in the Austrian interests at Kolin, Leuthen, etc.; favorite of Maria Theresa, and accompanied Catherine II. of Russia in the Crimea; his works on military affairs are numerous.

LIGNITE (Lat. *lignum*, wood), a mineral substance of vegetable origin like coal, but often showing a distinct fibrous or woody structure. It is light, friable, and porous, closely resembling charcoal, but brown in color, hence 'brown coal.' It occurs in beds like true coal, but is of much later geological age. Deposits of L. are found in many parts of the world. It is used as fuel, also in the manuf. of producer gas. Jet is a variety of L.

LIGNUM VITÆ, the heavy dark-colored, cross-grained heartwood of a small W. Indian tree (*Guaiacum officinale*) which, though soft while in the tree, becomes very hard, and is therefore of great value for making wooden rollers, rulers, pestles, pulley blocks, etc. The bark has medicinal properties.

LIGNY. See WATERLOO.

LIGONIER, JEAN LOUIS, EARL (1680-1770), Eng. field-marshal; distinguished at *Blenheim, Ramillies, Oudenarde, Malplaquet*; commanded at *Fontenoy*.

LIGUORI, ALFONSO MARIA DEI (1696-1787), Neapolitan R.C. theologian; founded order of Redemptorists; pub. *Glories of Mary*, 1750; *Homo Apostolicus*, 1755.

LIGURES BÆBIANI (*c.* 41° 20′ N., 14° 45′ E.), ancient town, central Italy; founded by Ligurians in II. cent. B.C.

LIGURIA (*c.* 43° 46′ to 44° 39′ N., 7° 30′ to 10° E.), division of N.W. Italy, bordering on Mediterranean; comprises Porto Maurizio and Genoa; area, 2037 sq. miles; surface generally mountainous produces oranges; cereals, iron and copper pyrites, manganese; manufactures textiles, hardware. Largest towns are Genoa and Spezia. Coast is known as Riveria, famous winter resort. L. came under Rom. control in II. cent. B.C., and as Rom. province included much larger area than present division. Archæological remains are still matter of antiquarian dispute. Pop. 1915, 1,269,506.

LI HUNG CHANG (1823-1901), Chinese statesman and military leader. He graduated from Hamlin College, Peking, in 1847, appointed financial commissioner of Su-chau in 1848, viceroy of Nanking 1865, of Canton 1867, and then of Tientsin until his death. He first became known to Europeans in 1863 when he helped Gordon suppress the Taiping rebellion. He was then governor of Kiang-su and in chief command of the Chinese army. In 1894 during the war with Japan he again commanded the Chinese and at the close of the war negotiated the treaty with the Mikado. He made a tour of Europe and the United States in 1896 and was warmly received. When Peking was occupied by the Allies after the 'Boxer' massacres, the Dowager Empress requested him to arrange terms. Li Hung Chang was enlightened and progressive and did much to establish native trading companies, and supported mining enterprises and railways.

LILAC, common shrub of order *Oleaceoe*, flowers characterized by tubular corollas and bell-like calyxes; colors—pink, violet, blue, white.

LILBURNE, JOHN (*c.* 1614-57); Eng. agitator; imprisoned, 1653-55; afterwards became Quaker.

LILIACEÆ, monocotyledons, usually herbaceous, but containing two tree-like forms, *Dracoena* (the dragon tree) and *Yucca*. The plants are usually perennials, possessing either a rhizome (Solomon's seal), corm (autumn crocus), or bulb (tulip), and well-developed leaves. Ruscus and Asparagus are exceptional in having the leaves reduced to scales, in the axils of which the flattened assimilatory branches (cladodes) are bone. The flowers are perfectly trimerous, with six perianth leaves, six stamens, and a trilocular ovary.

LILIUOKALANI (*b.* 1838), Queen of the Hawaiian Isl., sister of King Kalakaua, whom she succeeded in 1891. Her husband, John O. Dominis of Bos-

ton, became governor of Oahu, but after his death the queen, influenced by bad advisers, tried to set up a reactionary constitution for the liberal one of 1887. She was, therefore, deposed by the white population, who set up a republic. The islands were formally annexed to U.S.A. in 1898, and the queen retired to Honolulu.

LILLE, cap. Nord dep., and fortress, France (50° 38′ N., 3° 1′ E.); on the Deule, near Belgian frontier; important center of iron trade and of textile manufactures, which include linens, cottons, damask, tulle; sugar, soap, tobacco factories; dye works, chemical works, printing establishments, and distilleries; seat of univ.; taken by Marlborough (1708); unsuccessfully besieged by Austrians (1792); captured and occupied by the Germans (Oct. 7, 1914), and held by them until evacuation (Oct. 17, 1918). During the occupation the Germans exacted $50,000,000 from the town, and removed the greater part of the machinery from the factories to Germany; also deported many of the inhabitants. Pop. 1921, 200,952.

LILLEBONNE (40° 30′ N., 0° 32′ E.), town, Seine-Inférieure, France; Rom. remains. Pop. 6,000.

LILLIE, FRANK RATTRAY (1870), zoologist, *b.* at Toronto, Ont., *s.* of George W. and Emily Rattray Lillie. He graduated from the University of Toronto in 1891. He was an instructor in zoology at the University of Michigan from 1894-9 and professor of biology at Vassar College from 1899-1900 after which he became connected with the University of Chicago where he was later professor of zoology and embryology, chairman of the department of zoology and assistant curator of the Zoological Museum. He was also director of the Marine Biol. Lab., Woods Hole, Mass., and managing editor of the Biological Bulletin.

LILLY, WILLIAM SAMUEL (1840-1919), Brit. author; was secretary to Catholic Union of Great Britain, 1874-1919; author of *Ancient Religion and Modern Thought*, 1884; *India and its Problems*, 1902; *Christianity and Modern Civilization*, 1903, and *The New France*, 1913.

LILOAN (10° 20′ N., 124° E.), town, Cebu, Philippine Islands; fisheries. Pop. *c.* 16,000.

LILY (*Lilium*), genus of perennial, herbaceous monocotyledons, possessing a reserve of food stored in a scaly bulb; stem bears numerous decurrent, lanceolate leaves, and usually a racemose inflorescence; flowers are trimerous, with a petaloid perianth consisting of two whorls of three members, the edges of the outer members dovetailing into the specially grooved midrib of the inner ones; fruit is a capsule.

LIMA.—(1) (12° 3′ S., 77° 8′ W.), capital, Peru, S. America; R.C. archiepiscopal see; cathedral was completely ruined by earthquake, 1746, but was afterwards rebuilt; seat of central univ., founded 1551; has school of mines and civil engineering, library, Mint, several convents; trading center for W. coast of S. America; iron and copper works; manufactures gold lace, silverware, stamped leather, glass, furniture. L. contains tomb of Francisco Pizarro who founded city in 1535 and was murdered a few years later; held by Chileans, who sacked it thoroughly, 1881-83; frequently suffers from earthquakes. Pop. 1920, 176,467. (2) (12° 16′ S., 76° 30′ W.), maritime department, Peru, S. America; area, 13,310 sq. miles. Pop. 1920, 228,740.

LIMA, a city of Ohio, in Allen co., of which it is the county seat. It is on the Cincinnati, Hamilton and Dayton, the Erie, the Lake Erie and Western and other railroads, and on the Ottawa River. It is the chief center of the famous Lima oil fields which embrace six counties. It has railroad shops and plants for the manufacture of cars, locomotives and machinery. It also has petroleum refineries. Pop. 1920, 41,326.

LIMAN VON SANDERS, GENERAL (1856), Ger. soldier, *b.* in Pomerania, commanded 22nd Div. Prussian cavalry; sent to Constantinople at head of 'military commission' (1912); was placed in command of 1st Ottoman Army Corps, and organized the Turk. forces on the Ger. model. At outbreak of World War he supervised the defenses of the Dardanelles, and directed the operations against the British and French in Gallipoli, and subsquently (autumn 1917) in Syria against Allenby.

LIMASOL, LIMASSOL (34° 21′ N., 33° 4′ E.), port, Cyprus. Pop. 1920, 11,843.

LIMBACH (50° 53′ N., 12° 52′ E.), town, Saxony, Germany. Pop. 14,000.

LIMBURG (51° 15′ N., 5° 30′ E.), district now included in Dutch and Belg. provinces of L.; gave name to countship in IX. cent. and afterwards to duchy.

LIMBURG, LIMBOURG — (1) (51° N., 5° 30′ E.), province, Belgium; area *c.* 931 sq. miles. Pop. 1921, 302,988. (2) (51° 10′ N., 5° 55′ E.), province, Holland; area, 850 sq. miles. Pop. 1921, 440,843. (3) (50° 53′ N., 8° 3′ E.),

cathedral town, on the Lahn, Hesse Nassau, Germany; R.C. episcopal see. Pop. 11,000.

LIMBUS, LIMBO, the outskirts of hell, where infants dying unbaptized (*i.e.* in original, but without actual, sin) are believed by some sects to be; Old Testament saints, before Christ, were placed there (till liberated by Him) according to some theologians.

LIME, or **LINDEN** (*Tilia*), tree possessing horizontally spreading branches, and characterized by the inequality of the leaf lobes, which form a 'leaf mosaic.' The wood is much used by carvers and turners—though soft it is tough. The fibre is used in making rope, etc.

LIME, the fruit of sweet L. (*Citrus limetta*) and the W. Indian L. (*C. medica acida*). It is greenish yellow in color, about 1½ in. in diameter, and almost globular, but with a nipple at the top, and has a smooth, shiny rind. The juice is very acid, and is much used as a summer drink. *C. limetta* is a small prickly tree about 10 ft. high, with white blooms.

LIMELIGHT. See CALCIUM LIGHT.

LIMERICK.—(1) (52° 30′ N., 8° 45′ W.), county, Munster, Ireland; area, *c.* 1063 sq. miles; surface generally flat; hills on W. and S. borders; watered by Shannon; dairy-farming carried on, live-stock raised; contains several ruined monasteries. Pop. 150,000. (2) (52° 39′ N., 8° 36′ W.), town, Ireland, on Shannon; R.C. and Anglican cathedrals; formerly fortified; important port; lace manufacture, bacon-curing, distilling. Pop. 50,000.

LIMES, GERMANICUS, frontier lines which limited the Rom. provinces of Upper Germany and Rhætia; extended from Bonn to Regensburg.

LIMESTONE, a mineral of bluish-grey color, existing in numerous varieties which differ in appearance, structure, and composition. L. may be composed of pure lime, carbonic acid, magnesia, alumina, silica and iron. It is one of the most abundant of rocks, being commonest in the Secondary series; also found as the result of aqueous deposit. It has a granular structure. L. found in gneiss has large coarse grains; that found in mica-slate is fine-grained. The chief varieties of l. are Iceland spar, calcium spar, chalk, granular limestone, compact limestone, and oolite limestones. Carbonic l. is abundantly distributed, and stalactites (*q.v.*) and stalagmites are found in l. caverns. Petrifying wells, as at Knaresbro' (Yorks), cover objects placed under their dropping waters with l., and if left long enough will eventually solidify them. Marble possesses the same chemical composition as l., and is generally regarded as one of its varieties.

LIMITATION, STATUTES OF, Acts limiting right of action to fixed time after occurrence of events on which action is based.

LIMITATION OF ARMAMENT, CONFERENCE ON. See CONFERENCE ON THE LIMITATION OF ARMAMENTS.

LIMIT OF LIABILITY. See JOINT STOCK COMPANIES.

LIMOGES (45° 52′ N., 1° 17′ E.), town, Haute-Vienne, France; episcopal see; cathedral dates in part from XIII. cent.; manufactures fine china, textiles paper; formerly fortified; various Rom. remains, including part of amphitheater; captured by Black Prince, 1370; several times destroyed by fire. Pop. 1921, 90,187.

LIMON, PORT LIMON (10° N., 83° 15′ W.), seaport, Costa Rica, Central America; exports coffee, fruit. Pop. 1920, 10,231.

LIMONITE, important brown iron ore of fibrous structure, a natural hydrous ferric oxide, sometimes called brown hæmatite (*q.v.*); occurs in mammillated masses; found in England, Continent, and America.

LIMOUSIN (45° 30′ N., 1° 30′ E.), old province, France, now mainly included in Corrèze and Haute-Vienne; capital, Limoges.

LIMPETS, gasteropod molluscs with oval tent-shaped shells firmly attached to rocks or stones. The adhesion is made with a circular mass of muscle which when raised in the center forms a sucker. The shell is lined with a fringed mantle which bears a circlet of folds that take the place of the gills of other molluscs. Within the L.'s mouth lies a long radula or spiny tongue armed with about 2000 glassy hooks. This is used to collect vegetable food. *Patella vulgata,* the common L., is widely distributed on British and other rocky coasts. Some tropical species attain great size.

LIMPOPO, CROCODILE (25° 15′ S., 33° 28′ E.), river, S.E. Africa; rises in hills S.W. of Pretoria, and flows in semi-circle between Transvaal and Rhodesia and then across Portug. E. Africa, discharging into Ind. Ocean.

LINACEAE. See FLAX.

LINARES (1) (*c.* 35° 18′ S., 71° 48′ W.), province, Chile, S. America; area,

3941 sq. miles; vines, livestock. Pop. 1920, 119,284. (2) (38° 6′ N., 3° 42′ W.), town, S. Spain; silver-lead mining. Pop. 1919, 37,039.

LINCOLN.—(1) (53° 14′ N., 0° 33′ W.), county town, Lincolnshire, England, on Witham; important railway center; has canal communication with Nottingham, the Humber, Boston, and the Wash; manufactures agricultural implements, flour; has trade in corn and wool; great horse fair annually in April. L. is an episcopal see; has magnificent cruciform cathedral, dating from Norman times, and episcopal palace; castle was built by William the Conqueror; formerly seat of various monastic establishments; L. was an important station of Romans, of whose occupation various traces remain, including parts of town wall, gateway (Newport Arch), and old road; scene of battle between Stephen and Matilda, 1141, and of another battle in 1218; besieged by Roundheads, 1644. Pop. 1921, 66,020.

LINCOLN, a city of Illinois, in Logan co., of which it is the county seat. It is on the Illinois Central, the Chicago and Alton, and the Peoria, Decatur and Evansville railroads. It is the trade center of an extensive agricultural, mining and stock raising region. Within the city limits are four coal mines. It has grain elevators, planing mills, rolling mills, etc. Lincoln is the seat of Lincoln University, the State Asylum for the Feebleminded and an Odd Fellows Home for Children. Pop. 1920, 11,882.

LINCOLN, a city of Nebraska, the capital of the State and the county seat of Lancaster co. It is on the Burlington, the Union Pacific, the Chicago, Rock Island and Pacific, the Chicago and Northwestern, and the Missouri and Pacific railroads. It is halfway between Chicago and Denver and is 55 miles southwest of Omaha. It is the chief wholesale and jobbing center for an area embracing parts of six States. Its industries include the manufacture of mattresses, upholstery and lumber. Lincoln is the seat of the State University, Nebraska Wesleyan University, Cotner University, and Union College. It has a State Penitentiary, Insane Asylum, Home for the Friendless, several hospitals and a sanitarium. Its public buildings include the State Capital. Pop. 1920, 54,948.

LINCOLN, a city of Rhode Island, in Providence co. Its industries include the manufacture of dyes and the bleaching of cotton cloth. It has a public library and a public park. Pop. 1920, 9,543.

LINCOLN, ABRAHAM (1809-65 sixteenth president of U.S.; *b.* ne Hodgenville, Kentucky; had little schoo ing; brought up on father's farm journeyed to New Orleans on flatbo (1828); clerk of store at New Sale (1831); continued education in spa time; turned attention to law a politics; volunteered for service Black Hawk Ind. War, becomi militia captain (1832); defeated in ca didature for house of representative Illinois (1832); postmaster of New Sale (1833); surveyor of Sangamon c (1833). Became a member of the Il nois legislature (1834); re-elected (183 1838, 1840); advocated internal im provements and convention syster admitted to bar (1836); member Congress (1846); introduced 'Spot Res lutions' concerning Mexican invasio (1847); opposed slavery; retired fro political affairs (1852). On passing Douglas's Kansas-Nebraska Act, 185 when slavery question was reopene Lincoln again entered public life; b came leader of opposition in Illinoi met Douglas in public discussion nominated for senate by Republica (1858); won fame by speeches duri election campaign, but was not electe made a great speech against slavery New York (1860); elected preside (1860).

Seven slave-owning states th seceded from Union, forming the Co federate States; civil war began b Confederate siege and capture of Fo Sumter (1861). Lincoln proclaim blockade of southern ports, and arrang for raising of large army and nav approved passing of Act for emancip tion of slaves in Columbia (1862); b interfered to nullify Hunter's proclam tion of freedom to slaves in Georg Florida, and S. Carolina (1862); pr posed to give monetary compensati to states for gradual abolition of slaver without result; saving of the Unio even more than destruction of slaver was his aim. He made the introducto proclamation of emancipation in Se 1862; finally proclaimed freedom slaves in rebel states (Jan. 186 During the Civil War he preserv friendly relations with foreign stat thus preventing outside complicatio made famous speech dedicating batt field of Gettysburg as soldiers' cemete (Nov. 1863); executed draft to enfor conscription (1863); on suggestions r garding peace, announced willingne to stop war on submission of rebels national authority of Union constit tion. Re-elected president in 1864, held conference with Confederate Co missioners (Feb. 1865); adhered to co ditions that national authority must

restored in all states, that government would not withdraw concerning slavery, that no truce was possible except as end of war; terms rejected; war ended (April 1865); he entered Richmond after its surrender; assassinated at Washington (April 14). Simple and unaffected in manner; tolerant and honorable in character. A replica of the statue by Augustus St. Gaudens in Lincoln Park, Chicago, was erected in Canning Square, Westminster, as a gift from the people of the U.S.

LINCOLN, BENJAMIN (1733-1810), American military commander; *b.* Hingham, Mass. He was a farmer until the age of forty, but was very public-spirited and active in the political affairs of the Massachusetts colony, holding a number of administrative offices and serving in the colonial legislature and later in the provincial congresses. He was made a major-general in 1776, and rendered conspicuous services at the siege of Boston, the battle of Bemis' Heights and in co-operation with the French forces, in the attack upon Savannah, Ga. He stubbornly defended Charleston, S. C., against the siege by the British under Clinton, but was finally forced to capitulate to superior forces. He took part with distinction in the siege of Yorktown, and was designated by Washington to receive the sword of Cornwallis. He was Secretary of War (1781-83) was lieutenant-governor of Massachusetts in 1787, and in that same year commanded the forces that crushed Shay's Rebellion. In 1789 he was a member of the commission that negotiated a treaty with the Creek Indians. His later years were spent in literary and scientific pursuits.

LINCOLN COLLEGE, one of the group of colleges composing Oxford University, England. It was founded in 1427 by Richard Flemyng, bishop of Lincoln, who at first was inclined towards the doctrines of Wyclif but later repudiated them. Subsequent bishops of Lincoln have made the college their special care. John Wesley, the founder of Methodism was one of the graduates of Lincoln College. The institution has a fine modern library building, though most of the structures are of great antiquity.

LINCOLN HIGHWAY, a great national road which stretches across the United States from the Atlantic to the Pacific Ocean, with a total length of about 3,300 miles. It was projected and begun in 1913 and by 1923 was practically completed. It was originated by the Lincoln Highway Association and was intended to be a permanent memorial to the memory of the great president. The Lincoln Highway is a favorite route for automobile tourists.

LINCOLN, JOSEPH CROSBY (1870) American author; *b.* Brewster, Mass. He entered journalism as associate editor of the League of American Wheelmen Bulletin in 1896, holding that position until 1899 when he removed to New York. His novels deal almost entirely with the region of Cape Cod, Mass.; and his intimate knowledge of the quaint and interesting characters of that section and the inimitable drollery of his style have combined to give his works great popularity. His publications include *Cap'n Eri*, 1904; *Mr Pratt*, 1906; *Cy Whittaker's Place*, 1908; *Rise of Roscoe Paine*, 1912; *Cap'n Dan's Daughter*, 1914; *Mary 'Gusta*, 1916; *Extricating Obadiah*, 1917; *The Portygee*, 1919; and *Galusha the Magnificent*, 1921.

LINCOLN MEMORIAL, a beautiful edifice erected in memory of Abraham Lincoln, in Potomac Park, at Washington. It is at the Riverside extremity of the axis passing through the Capital and the Washington Monument. The great hall of the Memorial contains a colossal statue of Lincoln which is flanked on either side by plates bearing the Gettysburg and second inaugural addresses. The Memorial was completed and dedicated in 1921.

LINCOLN MEMORIAL UNIVERSITY, educational institution for both sexes at Cumberland Gap, Tenn. It was organized for the special benefit of mountaineers of that region, whose educational facilities were scanty. It comprises courses in literature, science and the arts, and devotes especial attention to agricultural and industrial work. It furnishes many opportunities for those of straitened means to earn their way through college. A summer school is maintained as an auxiliary institution. The college owns 675 acres of land and controls thousands of acres of woodland. In 1923 it had an enrollment of 769 students and there were twenty members of the faculty.

LINCOLN, MOUNT, one of a host of magnificent mountain peaks that tower skyward in the Park Range of the Rocky Mountains in Colorado, of which there are more than thirty which exceed 14,000 feet in height. Mount Lincoln, which has an altitude of 14,297 feet above the level of the sea, is on the northwest border of the South Park Range and about eleven miles N.N.W. of Fair Play. The view from its top is

one of indescribable majesty and grandeur. It has a silver mine on it at an altitude of 14,000 feet, in connection with Silurian limestone and quartzite.

LINCOLN, ROBERT TODD (1843), *s.* of President Abraham Lincoln; *b.* Springfield, Ill. He graduated at Harvard in 1864, and entered the Union Army, serving on the staff of General Grant until the end of the Civil War. He was admitted to the bar in 1867 and began the practice of law in Chicago. He served as Secretary of War in the cabinets of Presidents Garfield and Arthur (1881-85) and from 1889 to 1893 was United States Ambassador to Great Britain. Following that date he was president of, and director in, many large corporations. He was present at the dedication of the Lincoln Memorial in Washington in 1922.

LINCOLNSHIRE (*c.* 53° 15′ N., 0° 15′ W.), E. coast county, England; bounded N. by Humber, dividing it from Yorkshire; E. by North Sea, Wash, Norfolk; S. by Cambridgeshire, Northamptonshire, Rutland; W. by Leicestershire, Nottinghamshire, Yorkshire; area, 2646 sq. miles. Surface consists largely of low wolds and fens; drains to Trent, Withman, Welland; crossed by number of canals, largest of which, Foss-dyke and Car-dyke, have been attributed to Romans. County is divided for administrative purposes into three districts, called Parts of Holland, Parts of Kesteven, Parts of Lindsey. The county was occupied by the Romans, of whom traces remain; it was frequently invaded by Danes in VIII. and XI. cent's, and submitted to William the Conqueror in 1066; was scene of hostilities in Stephen's reign; rising known as Pilgrimage of Grace began here in 1536; supported Lancastrians in Wars of the Roses, Royalists in Civil Wars of Charles I.'s reign; was formerly the site of many monastic establishments, of some of which ruins remain. Soil is fertile, large area cultivated; produces barley, wheat, turnips, and other crops; horses, sheep and cattle are raised in large numbers; iron ore occurs as well as limestone, freestone, gypsum; there are important fisheries along coast; largest towns, Grimsby, Lincoln, (capital). Pop. 1921, 602,105.

LIND, JENNY (1820-87), Swed. singer (soprano); *b.* Stockholm; studied at Stockholm and Paris under Manuel Garcia; after great success on Continent, visited London, 1847; America, 1850; retired from operatic stage, and became concert singer, 1849; m. Otto Goldschmidt; teacher of singing, Royal Coll. of Music, London, 1883-86.

LINDEN (52° 22′ N.; 9° 42′ E.), town, Hanover, Germany. Pop 1920, 82,374.

LINDEN, See LIME.

LINDSAY, a city of Ontario, Canada. It is on the Grand Trunk railroad. It has a large trade in lumber and grain. It also has manufactures of importance. Pop. about 7,000.

LINDSAY (or **LYNDESAY**), **SIR DAVID** (1490-1555), a Scottish poet and Lyon King-of-arms, born at Garmylton, near Haddington. He was attached to the Scottish court in 1508, and later became an usher to James V. of Scotland, holding this position till 1522. From his writings it is evident that although L. took part in the court life his sympathies were with the people, and he was not afraid of rebuking the vices of the young king, with whom, notwithstanding, he was a favorite. *The Testament and Complaynt of our Soverane Lordis Papyngo* was written by L. as a satire on the *King's Flyting* as a rebuke of the king's licentiousness. His earliest poem is *The Dreme, c.* 1528, an allegory in the style of Chaucer, written in the seven line stanza. L.'s famous morality play, *Ane Satyre of the Thrie Estatis*, denouncing the clergy, appeared in 1540. His longest poem is *The Monarchie*, giving an account of the rise and fall of Syria, Persia, Greece, and Rome. Others include *The Complaynt of Basche, the Kingis auld Hounde, to Bawtie, the Kingis best belovit Dog, and his Companions*; *Kittie's Confessions*; and *Ane Description of Peter Coffer.*

LINDSAY, NICHOLAS VACHEL (1879), American poet; *b.* Springfield, Ill. He studied at Hiram College, Ohio (1897-1900) and for the next five years studied at art schools in Chicago and New York. He lectured before Y.M.C.A. organizations in various parts of the country (1905-08) and in the interests of the Anti-Saloon League (1909-10). His publications, chiefly poems, include *General William Booth Enters Heaven*, 1913; *Adventures While Preaching the Gospel of Beauty*, 1914; *The Chinese Nightingale and Other Poems*, 1917; *The Golden Whales of California and Other Poems*, 1920; and *The Golden Book of Springfield*, 1920. He is one of the leading representatives of the modern school of American poetry.

LINDSEY, BEN(JAMIN) B(ARR), (1869), American judge and reformer; *b.* Jackson, Tenn. He was educated in the public schools, studied law and was admitted to the bar in 1894. Since 1901 he has been judge of the juvenile court of Denver, Colorado, and in that posi-

tion has gained a national reputation because of his unique and in the main successful methods of dealing with juvenile delinquents. He was instrumental in having many laws passed looking toward a stricter responsibility being laid on the guardians and parents of children. His publications include *The Beast and the Jungle*, *The Rule of Plutocracy in Colorado*; *Pan-Germanism in America and The Doughboys' Religion*, 1919. He also lectured widely on children's problems.

LINDSEY, WILLIAM (1858), an American author; *b.* at Fall River, Mass. *s.* of William and Maria Lovell Lindsey. He was educated in public schools. From 1876-1899 he was engaged in banking, manufacturing and commission business first at Fall River and later at Boston, Mass., after which he established factories in Great Britain, France and Germany for the manufacture of a patented equipment for carrying ammunition, however he retired from business in 1904 and returned to Boston. Author: *Apples of Istakhar*, (poems), 1895; *Cinder Path Tales* (short stories), 1896; *The Severed Mantel* (novel), 1909 and *Red Wine of Roussillion* (drama in blank verse), produced in New York in 1917 under the title of *Seremonda*.

LINDUS (36° 23′ N., 28° 15′ E.), town, island of Rhodes, Gk. archipelago; now part of town of Rhodes.

LINE, may be straight or curved (See CURVE). Pieri defines the straight line joining two points as the class of points that are unchanged by a motion which leaves the two points fixed.

LINEN, cloth made from fibres of flax. Process of l. manufacture is shown on early Egyptian monuments; Jews took art to Canaan. L. was woven by Anglo-Saxons as early as VII. cent., and used in Europe for clothing in Middle Ages.

Fibres occurring in stem of flax are separated by soaking in water; next they are dried and combed into 'longs' and 'shorts'. Yarn is then spun and woven into cloth. Until comparatively recent times all spinning was done by spindle and distaff; in early machines spindle was rotated by hand; soon the treadle was introduced, and then the double spinning wheel, which was used until end of XVIII. cent. In modern l. manufacture the principal operations are *sorting* the fibres; *hackling*, combing, disentangling, and laying fibres parallel; *preparing*, drawing fibres into slivers, which is accomplished by series of operations similar to those described in cotton-spinning; *twisting* and winding on bobbins; *spinning*, of which there are two methods—the dry and the wet processes. Former is used for heavier yarns and the latter for fine yarns. Process resembles throstle-spinning as in cotton manufacture. Trade centers —*Heavy goods*: Dundee. *Damasks*: Belfast, Dunfermline, Perth. *Fine linen*: Belfast and N. Ireland. Center of trade in England: Leeds and Barnsley.

LING (*Molva molva*), a large, long-bodied, dark grey member of the Cod family, which may weigh 100 lb. and more. A common Brit. food-fish, found in deep water in the North Sea.

LING, PER HENRIK (1776-1839), Swed. inventor and instructor of gymnastic exercises without apparatus for the treatment of disease; founder and principal of the Royal Gymnastic Institute at Stockholm, 1813; his system, which is still taught and practiced, is of great benefit under many conditions of ill-health.

LINGARD, JOHN (1771-1851), R.C. historian; wrote *History of England*, generally regarded as the ablest history written from the standpoint of his Church.

LINGAYEN (16° 3′ N., 119° 58′ E.), town, Luzon, Philippine Islands. Pop. *c.* 22,000.

LINGUET, SIMON NICHOLAS HENRI (1739-94), Fr. journalist; admitted to the Bar, but subsequently interdicted from pleading; sent to the Bastille, 1780; released, exiled, but returned to Paris, 1791; guillotined, 1794; author of many hist. and satirical works.

LINIMENTS, or **EMBROCATIONS**, compounds of oils and alkalies, and being of a slighter consistency than ointments, rub more easily into the skin.

LINK. See CHAIN.

LINKÖPING (58° 24′ N., 15° 35′ E.), town, Sweden; episcopal see; fine Romanesque cathedral. Pop. 1921, 26,920.

LINLEY, Eng. family of musicians; associated with Bath and Drury Lane Theatre. Thomas (1732-95), composer; also a great teacher. Of his children, Elizabeth (1754-92), beautiful singer, married R.B Sheridan; son, Thomas (1756-78), was friend of Mozart; early death cut short brilliant career; William (1767-1837), composed songs.

LINLITHGOW (55° 58′ N., 3° 36′ W.) royal burgh, county town, Linlithgowshire, Scotland; ruined royal palace,

birthplace of Mary, Queen of Scots; decorated parish church; famous for wells; manufactures paper, soap, spirits. Pop. 1921, 3,882.

LINLITHGOWSHIRE, WEST LOTHIAN (55° 55′ N., 3° 40′ W.), co., S.E. Scotland; area, 120 sq. miles; surface undulating, slopes downwards from hills in S. to Firth of Forth on N.; watered by Avon, Almond; chief industry, agriculture; cereals, dairy farming; coal, iron, paraffin-oil shale, fireclay; contains ruined preceptory of Knights Hospitallers at Torphichen. Pop. 1921, 83,966.

LINNÆUS, CARL (1707-78), Swed. botanist; *b.* Rashult; studied med., and acted as assistant in bot.; he traveled in Lapland, Holland, France, and England. After his return to Sweden he practiced as a physician; became prof. of Med. and of Bot. at Upsala, where he died. His chief contribution to science was a remarkable artificial classification of plants founded on the characters of the stamens.

LINNEA, a genus of plants comprising the honeysuckles. It is found in North America as far south as Maryland, and in parts of Europe.

LINNET, See FINCH FAMILY.

LINOLEUM, a preparation of linseed oil which has become solidified when mixed with chloride of sulphur, and it depends upon the proportions used as to what consistency of substance will be produced. L. can also be produced by means of a heating and drying process without the addition of chloride of sulphur. The preparation thus obtained, if crushed, then pressed between hot rollers, helps, with the addition of shellac or naphtha, to manufacture new articles, such as waterproof fabrics, carriage aprons, tank linings, etc. But the word L. now chiefly applies to a substance for floor covering.

LINOTYPE, a modern composing machine used by printers, resembling the typewriter in its keyboard and similarly actuated by the operator. Once the fingers of the operator start it in moulding type, a number of automatic movements are set in motion that produce a 'line of type,' called a slug, which finds its place in a galley. The machine, which has become the standard typesetting device for newspaper, book and job work, was the invention of Ottmar Mergenthaler (*q.v.*) a German by birth, who perfected it in 1885 while living in Baltimore. It was first put into practical use by the New York *Tribune* in 1886.

Type machines first set single letter or ordinary type. The Linotype sets not type, but a complete mould of space words as a matrix for the type. Th matrices which are flat pieces of bras with the type face on one side, slid singly from where they are collecte in magazines at the top of the machin when the operator touches the keyboard and receive the imprint of the letter until a line is formed. A bell sound the completion of each moulded line which is mechanically transferred to th operation of a connected apparatus tha pours molten metal into the matrix. line is thereupon produced like one se by the old hand method and assemble in a composing stick, but with the dif ference that it is a solid row of moulde type, not of individual type letters.

The machine automatically withdraw the matrices, removes the mould, plane the cast-metal line, ejects and deposit it on a galley in proper order with thos preceding it, and ready for the press As soon as the line of matrices an spaces is withdrawn from the mould the machine automatically picks ther up, and distributes each matrix in it proper magazine on the top of th machine from which it started, read to repeat the process for the next lin the operator taps. The automati functions of the machine are many an they proceed in due order with th precision and regularity of clockwork

LINSEED (*Linum usitatissimum*), plant introduced from Mediterranean and extensively grown in Ireland fo linen yielded by fibres; seed has a muc laginous coat and yields l. oil, the refus being utilized as oil cake for cattle.

LINTON, a city of Indiana, in Green Co. It has coal mines, and other indus tries. Pop. 1920, 5,856.

LINUM. See FLAX.

LINUS, ST., traditional first bp. Rome and successor of St. Peter.

LINZ (48° 17′ N., 14° 18′ E.), town Austria; capital of Upper Austria episcopal see, two cathedrals; manufac tures textiles, carpets, machinery, to bacco. Pop. 1920, 94,072.

LION. See under CAT FAMILY.

LIP, term applied to each of the tw muscular folds, formed by the orbicular oris muscle and covered with mucou membrane, surrounding the entrance t the mouth, and important in the pro duction of certain sounds in speech.

LIPA (*c.* 13° 50′ N., 121° 15′ E. town, Luzon, Philippine Islands. Po 38,000.

LIPARI ISLANDS, ÆOLIAN ISLANDS (38° 35′ N., 14° 50′ E.), volcanic islands, Sicily; most important are Lipari, Stromboli, Vulcano; chief town, Lipari; produce pumice stone, sulphur, wine, fruits, borax. Pop. 21,000.

LIPETSK (52° 35′ N., 39° 37′ E.), town, Russia. Pop. 21,000.

LIPPE (52° N., 8° 50′ E.), former principality, N.W. Germany, in basin of Weser; sometimes called Lippe-Detmold; area, 469 sq. miles; surface generally mountainous; well wooded. Present dynasty was founded in XII. cent.; succession dispute was settled in favor of Lippe-Biesterfeld line by court at Leipzig, 1905. L. became member of N. German Confederation, 1866. Chief industry is agriculture; horses, cattle, and pigs reared; manufactures meerschaum pipes, tobacco; capital, Detmold. L. has Diet of 21 members, and is represented in Reichstag, as in Bundesrath, by one member. Pop. 1920, 154,318.

LIPPE (51° 40′ N., 6° 37′ E.), river, Germany; joins Rhine.

LIPPI, the name of two Florentine painters, father and son. The father, commonly known as Lippo Lippi (1412-69) painted chiefly religious subjects. His illustrations of the lives of Saint John the Baptist and Stephen on the choir walls of Prato Cathedral are regarded as his greatest work. He painted several Madonnas, and among his altar-pieces, one in the nunnery chapel of S. Ambrogio, Florence, is the subject of a poem by Browning. The son, Filippino L. 1460-1504, painted easel pictures, and executed some celebrated frescoes for churches in Florence and Rome.

LIPPINCOTT, JOSHUA BALLINGER (1813-86), a publisher, *b.* in Juliustown, New Jersey. He was a bookseller in Philadelphia, 1831-36, and founded in 1836 the house of J. B. Lippincott & Co., which by 1850 was at the head of the book trade in Philadelphia. After his death, 1886, the firm was converted into a company. *Lippincott's Magazine* was founded in 1868.

LIPPINCOTT, MARTHA SHEPARD, writer, *b.* in Moorestown, N. J. Educated at Swarthmore College, 1886 when in school began writing poetry. Since 1895 has written poems, book reviews and prose for religious papers, newspapers and magazines. Member of Society of Friends and called 'The Quaker Poetess.' Author of: *Visions of Life,* 1901. Over three thousand poems among them being, *Guide Thou My Bark, Thou Wilt Guide My Journey Through, That All Thy Mercies May Be Seen, Teach Me Thy Will, For Thy Own Dear Self, To My Valentine, My Love For All Eternity, Sleep Little Birdies, Faith and Trust.*

LIPPINCOTT, SARAH JANE (CLARKE), (1823-1904), an American author, who wrote under the name of Grace Greenwood. She was born in Pompey, N.Y. She began to write at an early age, and contributed much both in prose and poetry to contemporary magazines. Her books include *Greenwood Leaves, Poems, Records of Five Years, Recollections of My Childhood, Stories and Legends of Travel.*

LIPPITT, HENRY FREDERICK (1856), America business man and legislator; *b.* Providence, R.I. He graduated at Brown University in 1878 and entered the cotton manufacturing business, becoming general manager of the Manville Co. and serving as officer and director in many financial and business enterprises. He engaged actively in politics as a Republican and was chosen United States senator in 1911 for the full six year term.

LIPPMANN, WALTER (1889), Amer. author and journalist; *b.* in New York City. He graduated at Harvard in 1910 and entered newspaper work, first as associate editor of the New Republic and later as member of the editorial staff of the New York World. He served as assistant to the Secretary of War, 1917, and later was captain in the Military Intelligence section attached to the General Staff of the A.E.F. He has written largely for periodicals, and in addition his publications include *Drift and Mastery,* 1914; *The Stakes of Diplomacy,* 1915; *The Political Scene,* 1919; *Liberty and the News,* 1920, and *Public Opinion,* 1922.

LIPPSTADT (51° 40′ N., 8° 20′ E.), town, Westphalia, Prussia. Pop. 17,000.

LIPSIUS, JUSTUS (1547-1606), Belg. scholar; his *magnum opus* is his edition of Tacitus. He conformed to the Lutheran Church, but afterwards became reunited to the Catholic.

LIPTON, SIR THOMAS JOHNSTONE (1850), Brit. merchant; in 1896 his business was converted into a limited liability company, with a capital of $12,500,000, of which he was chairman; was noteworthy for his public benefactions, and received a baronetcy, 1902. Devoted to yacht-raising, he made four attempts to capture the American Cup. Against *Resolute,* he secured two wins out of the five races.

LIQUEFACTION OF GASES. The condition necessary for the liquefaction of a gas is a low enough temp., accompanied by sufficient pressure. When

the pressure on a gas is increased, the temp. of liquefaction is raised. For every gas there exists a 'critical temperature,' above which it is impossible to liquefy it by compression; the pressure under which a gas is liquefied at its critical temp. is 'critical pressure'. When this principle was recognized attempts were made to liquefy the 'permanent gases' under pressure by cooling them below their critical temp. Thus, in 1877, Pictet and Cailletet independently liquefied oxygen in quite different ways. In Pictet's apparatus, carbon dioxide (critical temp. 31·3° C.) was liquefied by compression, while it was cooled by being surrounded with liquid sulphur dioxide, boiling under reduced pressure at -65° C. This cooled liquefied carbon dioxide was conveyed to a cylinder surrounding a steel tube which contained oxygen compressed to 320 atmospheres; there it was made to evaporate so rapidly by pumping that its temp. fell to -140° C. Thus the oxygen, being cooled below its critical temp. (-118·8° C.), was turned into a liquid. Cailletet liquefied oxygen by the further cooling caused by the sudden expansion of the compressed and already cooled gas.

Liquid Air.—Air is liquefied by the process known as 'self-intensive refrigeration.' When gases pass through a narrow orifice from a high to a lower pressure they are cooled in the process, not because of external work performed, but by reason of internal work done against cohesion, a certain amount of which exists between the molecules of all gases at high pressure. This cooling, called the Joule Thomson effect, amounts for air to 0·2-0·25° C. per atmosphere.

The principle was applied by Linde and by Hampson in 1895. Air is compressed to 160-180 atmospheres in cylinders cooled by water, and, after being dried and freed from carbon dioxide passes through a narrow spiral tube terminating at a regulated valve, through which it expands freely. The escaping air, cooled by its own expansion, passes over the coil through which the compressed air is being driven, cooling the latter before it expands. Thus the temp. of the issuing air is continuously lowered, until some of it liquefies as it escapes from the valve. Liquid air may drop from the orifice in about four minutes after the pumps have begun to work, and from 1 to 1½ litre of it be obtained per hour.

Liquid air, whose critical temp. is about -140° C. and critical pressure about 39 atmospheres, boils under one atmosphere at about -190°C. It generally contains more than twice as much oxygen as atmospheric air, because oxygen is more readily condensed th nitrogen. Oxygen is now obtain from liquid air by fractional evaporati of the more volatile nitrogen. The ra gases of the air—helium, neon, krypto and xenon—are also separated fro argon by fractional evaporation of t liquefied mixture. Liquid air evaporat rapidly in ordinary vessels, congeali the moisture in the adjacent air, whi falls as heavy clouds. It possess motive power analogous to that of boili water, but an objection to its use is t formation of ice round the machine containing it. Cotton wool, mixed wi granulated charcoal, and soaked liquid air, may be exploded by deton tion, and has been used for blasting coal mines. Liquefied gases are pr served in double-walled evacuated gla vessels, which may be silvered, and a known as Dewar flasks. Evacuati reduces thermal conduction to a mi mum, and silvering hinders radiatio *Thermos flasks* are constructed on t same principle.

Liquefaction of Hydrogen.—Liqu hydrogen was first obtained in bulk Dewar in 1898, by cooling the g compressed to 150 atmospheres by mea of liquid air boiling at -205° C., and th allowing it to expand. It is a cle colorless liquid, boiling under atmo pheric pressure at -252·5° C., and beco ing an ice-like solid at -257° C. critical temp. is about -238° C., a critical pressure about 15 atmosphere *Liquefaction of Helium.*—Helium w liquefied by Kamerlingh Onnes in 19 by expansion from high pressure aft cooling in liquid hydrogen. Its b.p. -268·5°C.

LIQUEURS, strongly alcoholic be erages, flavored aromatically and oft sweetened. *Absinthe* is yellowish-gree contains over 50% alcohol, and oil wormwood, anise, cloves, angelica, a peppermint. Others are Chartreus Benedictine, Curaçoa, Ratafia, Vermut

LIQUOR REGULATION. Befo the operation of the National Prohibiti Act in January, 1920, the Americ liquor traffic was controlled by ma legal restrictions in those states that h not already adopted laws prohibiting t manufacture and sale of alcoholic liquo High fees were charged for licensing saloon to conduct business, the purpo being to curb an increase of su establishments by making the cost license serve as a prohibitory tax. Ma cities in the West exercised municip ordinances segregating the traffic certain areas and forbidding the sale liquor in specified residential district Another restraining measure was limiting the number of saloons a

other places where liquor was sold according to a fixed ratio of the population. In Massachusetts one saloon only was permitted for every thousand inhabitants of the state at large, and one to every 500 in Boston. A common provision was that liquor should not be sold within a prescribed distance of churches, schools and like institutions. Saloons were also forbidden to open for trade on Sundays, and on certain other days, including Election Day. Women and children could not be employed in the sale of liquor, nor could minors, habitual drunkards or intoxicated persons generally be served. A forerunner of prohibition was the application of the principle of local option, which allowed counties, cities or towns to decide by popular vote whether the sale of liquor or otherwise should be permitted within their districts. Local option came into force in practically all the states that had not adopted prohibition before federal legislation authorized by the Eighteenth or Prohibition Amendment to the Constitution influenced them to do so. Regulation, however stringent, had little effect in diminishing the traffic, and became automatically superfluous as the liquor states were reduced in numbers through additions to the prohibition group.

The movement for total prohibition of the manufacture and sale of intoxicating liquors went on side by side with liquor regulation. One by one the states decided eventually that the traffic could not be controlled effectively and that the only recourse was abolition. The first prohibitory laws were passed by Tennessee, 1838 and Maine 1846. Vermont, Rhode Island and Massachusetts in 1852, Connecticut in 1854 and New York and New Hampshire in 1855 adopted similar laws. These enactments did not prove operative, and in most cases were repealed, local option taking their place. Another generation passed before prohibition acquired a firm footing as a social reform. It was stimulated to a vigorous life in the Middle West when Kansas in 1880 incorporated a prohibition amendment in its State constitution. Iowa adopted a like amendment in 1882, followed by Ohio, Maine, Rhode Island, South Dakota, and North Dakota. But in all these cases, except Maine and North Dakota, the prohibitory laws were repealed or annulled towards the close of the nineteenth century.

With the opening of the twentieth century the movement developed in the South, with Oklahoma, Alabama, Georgia, Mississippi and North Carolina becoming 'dry' in 1907 and 1908, West Virginia, Arkansas, South Carolina, and Virginia following a few years later. About the same period Idaho, Colorado, Oregon and Washington joined the prohibition states, 1915-16. The elections of the latter year made Michigan, Montana, Nebraska and South Dakota 'dry.' By July, 1917, prohibition was in force in twenty-three States, and its subsequent triumph was stimulated by the passage of the federal legislation which forbade the production of alcoholic liquors for the duration of the World War, and which was strengthened by the Food Stimulation Act, enacting nation-wide prohibition from June 30, 1919, until the demobilization of the army.

The movement for national prohibition received its first great impetus in the passage by Congress in 1917 of a resolution asking the legislatures of the forty-eight states to pass upon an amendment to the federal constitution forbidding the manufacture and sale of intoxicating liquors. The States must sanction such an amendment by two-thirds majority and it was then the province of Congress to carry out the will of the States. By the beginning of 1919 the necessary thirty-six States had ratified the national prohibition amendment, and on January 29 it was proclaimed as a valid part of the Constitution. It went into effect on January 16, 1920. War-time prohibition was in operation, and the ratification of the Eighteenth Amendment merely continued permanently the provisional prohibition earlier enacted. In October 1919, the Volstead, or National Prohibition Act had been passed by Congress, limiting the amount of alcohol permitted in any beverage to half of one per cent. President Wilson vetoed the measure, but both houses promptly passed it over his veto. Rhode Island and New Jersey before the Supreme Court, challenged the right of Congress to interfere with the police power of the State in liquor control, but without avail. The Court declared the act constitutional. Most of the States adopted enforcement measures which augmented national prohibition legislation. The result was that while outwardly the liquor business became extinct, mainly by voluntary submission to the law and in no small part also through wholesale confiscation of liquor stores by government raids and by wholesale prosecution, illicit distilling developed all over the country, and rum-smugglers conducted a thriving traffic across the land and sea borders, especially from Canada and the West Indies. Repeated attempts to contest the validity of the prohibition law were negatived by the Supreme Court, which ruled in 1923 that its operation even extended to forbidding foreign

vessels to have liquor on board while within the three-mile limit of American waters. A recoil from the drastic operation of both federal and state prohibition laws came in New York, the State legislature of which in May, 1923, repealed the enforcement measures known as the Mullan-Gage law.

The effect of national prohibition upon the liquor industry as reported by the Census Bureau, was that while in 1914 there were 434 establishments engaged in the manufacture of distilled liquors, only 33 plants were in operation in 1921. In that year distilled spirits were produced to the amount of 87,896,450 gallons, manufactured mainly from molasses, with California and Nevada, Illinois, Louisiana and Mississippi, Maryland, including two counties in Virginia and Pennsylvania as the leading producers. In the seven-year period 1914-21 the establishments making vinous liquors declined from 209 to 72, and those making malt liquors from 1,204 to 531. The results of prohibition were least visible in the figures reporting the continued manufacture of malt liquors, for the reason that many breweries continued in operation as producers of 'near beer' (containing only half of one per cent of alcohol, as prescribed by the Volstead act) and allied products. There was a decline of 79 per cent. in the value of the products of establishments making liquors and a decrease of 72 per cent in the number of persons employed. The surprising feature of the Census report was that in 1921 there were 636 concerns manufacturing liquors legitimately and reporting their output to the Bureau. Some of the surviving breweries, though ostensibly producing non-alcoholic beverages, were suspected of selling beer containing a forbidden amount of alcohol and their detection proved to be one of the most difficult problems with which the prohibition officials had to contend.

The government accumulated an enormous amount of bonded whiskey, stored in warehouses, which could be withdrawn for legitimate uses as prescribed by the prohibition act, especially for industrial purposes. In April, 1923 whiskey stocks amounted to 800,000 barrels and were concentrated in warehouses where they could be guarded and their withdrawal supervised by prohibition officers. The precaution was taken to prevent thefts by forged orders or by physical force, both of which means had been frequently used to obtain liquor for sale through the agency of bootleggers.

LIQUORICE, LICORICE, root of European *Glycyrhiza glabra*; extract used medicinally as demulcent; als employed in confectionery.

LIRA (Lat. *libra*, pound), Ital. sta dard silver coin; equivalent (since 186 of franc; plural, *lire*; contains 10 *centisimi*. Turk. lira, or pound,

LIRI (41° 51′ N., 13° 30′ E.); rive Italy; enters Tyrrhenian Sea.

LISBON, LISBOA (38° 41′ N., 9° 1 W.), capital, Portugal, on Tagus. L. wa an important city under Romans, fro whom it passed to Visigoths early in V cent.; held by Moors, VIII.-XII. cent's taken by Portuguese, 1147; twice b sieged by Castilians, 1373, 1384; ca tured by Spaniards under Alva, 158 retaken by Duke of Braganza, 164 almost entirely destroyed by eart quake, 1755, since when it has bee practically rebuilt; scene of assassinatio of King Carlos, 1908; and Revolutio 1910. L. is an archiepiscopal see; ha cathedral built originally *c.* 1150, bu twice restored; several fine churche two royal palaces, military arsena many educational and charitable inst tutions; fine aqueduct; near riv is Hieronomyte monastery, containin tombs of Vasco da Gama, Camoen Catharine of Braganza. City is strongl fortified; has one of finest harbors i Europe; center of trade with Europ W. and S. Africa, S. America; export wines, fruits, corkwood, oil, salt, leathe wool, cattle, pit-props, tinned fis imports cottons, woolens, silks, coa iron, machinery, rubber, tea, coffe manufactures gold and silverwar tobacco, textiles, chemicals. Pop. 192 489,667. See Portugal.

LISIEUX (49° 8′ N., 0° 13′ E.); tow Calvados, France; has former cathedra bp.'s palace; formerly fortified; textile dairy produce, machinery. Pop. 17,00

LISKEARD (50° 27′ N., 4° 27′ W. town, Cornwall, England; woolens, iro goods; formerly a stannary town. Po 1921, 4,376.

LISMORE.—(1) (56° 30′ N., 5° 3 W.), island, Loch Linnhe, Argyllshir Scotland; choir of old cathedral remain site of former monastery. Pop. 50 (2) (28° 47′ S., 153° 10′ E.), cathedra town, New South Wales, Australi R.C. episcopal see. Pop. 8850. (3 (52° 8′ N., 7° 55′ W.), town, Waterfor Ireland; cathedral dates in part fro XII. cent.; formerly seat of monaster and bishopric. Pop. 1600.

LISSA.—(1) (43° 4′ N., 16° 10′ E. island, off coast of Dalmatia, Adriati Sea; area, 40 sq. miles; wine, sardine chief town is fortified seaport of Liss Near here were fought two nava

engagements in XIX. cent.; British defeated Franco-Venetian force, 1811; Austrians defeated Italians, 1866. Pop. 11,000. (2) (51° 51′ N., 16° 33′ E.), town, Posen, Germany; formerly chief Polish settlement of Moravian Brethren; machinery, shoes, leather. Pop. 17,000.

LIST, FRIEDRICH (1789-1846), Ger. economist; prof. of Politics at Tübingen, 1817; known chiefly as economist; opposed free trade as universal rule.

LISTER, JOSEPH, 1ST BARON (1827-1912), Eng. surgeon, *b.* at Upton, Essex. Was appointed to the chair of surgery in Glasgow Univ. 1860, to that of clinical surgery in Edinburgh Univ. 1869, and to the chair of clinical surgery, King's Coll., London, 1877, from which he retired in 1893. Influenced by Pasteur's discoveries of the origin of fermentation and putrefaction, Lister began his far-reaching and important work on the cause and prevention of septic infection of wounds, which speedily led to his employing antiseptics in all surgical operations. The immediate and definite success of the Listerian treatment soon led to its adoption by surgeons everywhere. He was president of Brit. Association, 1896, and of Royal Soc. 1895-1900. In 1883 he was created a baronet, and in 1897 raised to the peerage. In addition to many important papers he has pub. *On the Effects of the Antiseptic Treatment upon the Salubrity of a Surgical Hospital*, 1870, and *A Contribution to the Germ Theory of Putrefaction and other Fermentative Changes*, 1875.

LISTON, ROBERT (1794-1847), Scot. surgeon; lectured in Edinburgh on surgery and anatomy; prof. of Clinical Surgery at University Coll., London, 1835; a brilliant operator, and author of several works on surgery.

LISZT, FRANZ (1811-86), Hungarian composer and brilliant pianist; *b.* Raiding; studied with Czerny and Salieri, Vienna; settled in Paris as teacher, 1827; formed intimate relations with Countess D'Agoult, by whom he had three children; the youngest, Cosima, married von Bülow and afterwards Wagner. L. was greatly influenced by Chopin, Paganini, and Berlioz; app. conductor of Court Theatre, Weimar, 1847, and closed his career as virtuoso; took orders at Rome 1865 and became Abbé; thereafter spent most of his time in Weimar, Rome, and Budapest. L. formed a deep and lasting friendship with Wagner, who owed much of his success to him during the Weimar period. Lyrical pianoforte pieces and songs are perhaps his best works. Orchestral compositions, *Dante* and *Faust* symphonies, *Les Preludes*, *Mazeppa*, etc.

LITANY (Gk. *litaneia*), first denoted prayers of all kinds, then specially prayers of supplication and intercession. The R.C. Church has *Litaniae majores* and *Litaniae breves*; the Anglican l. follows the former, but without invocation of saints; in the Ambrosian rite the lesser l. appears in the Mass.

LITCHFIELD, a city of Illinois, in Montgomery co. It is on the Cleveland, Cincinnati, Chicago and St. Louis, the Illinois Central and other railroads. It is surrounded by a region rich in coal, natural gas and oil. Its industries include the manufacture of machinery, railroad cars, brick, tile and flour. The public institutions include a public library, a high school and a hospital. Pop. 1920, 6,215.

LITCHFIELD, GRACE DENIO (1849), American author; *b.* New York City. Much of her life has been spent abroad, but since 1888 she has resided in Washington, D.C. She has written many novels and some volumes of verse. Her publications include *The Knight of the Black Forest*, 1885; *Mimosa Leaves*, 1895; *The Moving Finger Writes*, 1900; *The Letter D*, 1904; *The Supreme Gift*, 1908; *Baldur the Beautiful*, 1910; *The Nun of Kent*, 1911, and *The Burning Question*, 1913. Of her poetical works may be cited *Collected Poems*, 1913, and *The Song of the Sirens*, 1917.

LITCHI or **LEE-CHEE**, fruit of a tree belonging to natural order Sapindacae, a native of South China. The berry is red or green, about 2 inches in diameter. The pulp is sweet. The fruit is dried and exported.

LITERATURE is the body of writings of a people preserved on account of its beauty of thought and style; lit. falls into two great classes—prose and poetry, and each of these is divisible into many species, according as the basis of division is form or matter. Gk. lit. developed spontaneously and without external influence; it perfected all the principal types, except prose fiction. See under different countries.

LITERNUM (*c.* 41° 55′ N., 14° E.), former town, Campania, Italy; no remains visible.

LITHGOW (33° 30′ S., 150° 14′ E.), town, New South Wales, Australia; government small arms factory; iron smelting, rolling-mills. Pop. 1920, 10,900.

LITHIUM (Gk. *lithos*, 'a stone'), metallic base of alkali lithia, of silvery lustre; used in making of fireworks,

causing beautiful red color; carbonate dissolves uric acid and accordingly is used medicinally in treatment of gout and rheumatism.

LITHOGRAPHY. See COLOR PRINTING.

LITHOTOMY. See BLADDER.

LITHUANIA, republic, consisting of former Russian governments of Vilna and Kovno, with portions of Grodno, Moghilev, and Vitebsk (55° N., 25° E.); bounded N. by Kurland, E. by White Russia, S. by Poland and districts of Memel and Tilsit, at present under League of Nations, and W. by Baltic Sea. Agriculture is the principal occupation. Cap. is Vilna. From the 10th cent. the Lithuanians have been divided into the three chief branches of (1) Lithuanians proper, (2) Letts or Latvis, (3) Prussians. The Prussians have always apparently been confined to the Baltic coast near the Lower Vistula, chiefly to the E. of that river; they have been wholly absorbed by Germanic influences. The Letts, pushed towards the N., have been largely mingled with Livonians and Esthonians. The Lithuanians proper, after founding an independent power of vast extent, joined more and more closely with the Poles, and fell under the Russian sway at the dissolution of the Polish state. The Lithuanian tongue has great affinities with Slavonic, but cannot be considered a Slav language; it is by far the most archaic of all living Aryan tongues. Before the union with Poland, begun in 1386 and consummated in 1569, the Lithuanians were either pagan, the vast majority were heathen up to 1386, or Gr. Orthodox. The Polish connection established the R.C. ascendency. Kosciuszko was a Lithuanian, and the prov. of Vilna was a main center of the Polish insurrection of 1863, crushed in Lithuania by General Muraviev. The republic was established in 1918. For war connection, see RUSSIA. Area, *c.* 70,000 sq. m.; pop. (est.) 7,000,000. See MAP BALTIC STATES.

LITMUS, extract of lichens *Lecanora tartarea* or *Rocella tinctoria,* used for testing in acidimetry; acids turn l.-paper red, alkalies blue; prepared by adding potassium carbonate to lichen and mixing with gypsum.

LITOPTHERNA, sub-order of ungulate mammals from S. Amer. Tertiary; two families, *Proterotheriidoe* and *Macraucheniidoe*; typified by macrauchenia (*q.v.*).

LITTLE FALLS, a city of Minnesota, in Morrison co., of which it is the county seat. It is on several important railroads and on the Mississippi River. Its industries include sawmills, p mills and paper mills. Pop. 1920, 5,5

LITTLE FALLS, a city of New Yo in Herkimer co. It is on the New Yo Central and Hudson and the West Sho railroads, on both sides of the Moha River. It is the center of an extensi dairying region and its industries inclu the manufacture of lumber, knit goo and calf skin. It is the seat of the Uni Free School and Academy. It has public library and a hospital. Po 1920, 13,029.

LITTLEFIELD, WALTER, (1867 Author, Journalist. 1888-93 student Harvard. 1890-92 taught French a ancient history at school in Bosto Since 1897 in editorial department New York paper. American correspo dent of Paris paper. 1903-13 litera correspondent of Chicago paper. Auth of: *The Truth about Dreyfus.* Editor *The Power of Sympathy,* 1892; *Letters an Innocent Man* (Dreyfus), 189 *Early Prose Writings of James Russ Lowell,* 1902. *Bismarck's Letters to Wife from the Seat of War, 1870-187 1903, Love Letters of Famous M and Women* (four volumes with Lio Strachey), 1909-10. Translated *T Kaiser as He Is,* (Le Veritable Guillaur II.), by Henry de Noussance, 1905.

LITTLE ROCK, a city of Arkans the capital of the State and the coun seat of Pulaski co. It is on the St. Lou Iron Mountain and Southern, the S Louis and Southwestern and the Ro Island railroads, and on the Arkans River. It is the chief trade and jobbi center of the State. Its industries clude cottonseed oil mills, gas wor railroad shops, machine shops, etc. Lit Rock is the seat of the Law and Medi College of Arkansas, Arkansas Industr University, Arkansas School for De Mutes and the Blind, Little Ro University, Arkansas Female Colle and the Philander Smith College. public buildings include the Sta Capital, State Library and St. Joh Military College, and has high scho and several convents. The city w settled in 1814 and became the capi of the territory in 1820. During t greater part of the Civil War it w held by the Confederates. Pop. 19 65,142.

LITTLETON, MARTIN WYL (1872), lawyer; *b.* in Roane co., Te nessee. 1891 admitted to bar. 1893-18 practiced at Dallas, Texas. Since 18 in New York. 1893-1896 prosecuti attorney at Dallas. 1900-1904 assista district attorney, Kings County, N York. 1904-1905 President of Borou of Brooklyn. 1904 delegate to De

ocratic National Convention from New York. 1911-1913 member of Congress, 1st New York District.

LITTLETON, SIR THOMAS DE (*c.* 1402-81), Eng. jurist; student of the Inner Temple; sheriff of Worcestershire, 1447; sergeant-at-law, 1453; king's sergeant, 1455; justice of the Common Pleas, 1466; knighted, 1475; author of a legal treatise on 'Tenures' (written in Law-French), which, edit. by Sir Edward Coke (1628), was for long the standard and authoritative text-book on the law of Real Property in England; first pub. 1481; 90 editions subsequently issued. Throughout the Wars of the Roses L. was recognized equally by Henry VI. and Edward IV.

LITTRÉ, MAXIMILIEN PAUL ÉMILE (1801-81), Fr. philosopher and philologist; studied languages and med., then devoted himself to literary work; became follower of Comte, though he did not follow him entirely; his elaborate Fr. dictionary appeared, 1873, after many years' work; pub. *Auguste Comte et la philosophie positive*, 1863; edit. Hippocrates and Pliny; a convinced materialist.

LITURGY.—In ancient Athens a *Leitourgia* was a service rendered to the state; word came to be used in Christian Church of service rendered to God in public worship, and particularly of the Eucharist, which it signifies in the East. In present Eng. usage it means any written or prescribed form of prayer or worship, as distinct from that which is extempore. The different forms of the Eucharist, specially called l's, are of considerable importance in the history of Christian worship. The main division is that into Eastern and Western. The Rom. Rite is now used almost universally in the R.C. Church in the West, though it only gradually superseded various local rites, (*e.g.*) the Jozarabic in Spain and the Gallican in France; the Ambrosian is still used in Milan. The main Eastern Rites are the Syrian, Egyptian, Persian, and Byzantine, which exist both in obsolete and in still current forms.

In Britain there were various l's used in the ancient Celtic Church. In Norman times certain features were introduced from the Gallican l., and the *Sarum Missal* became regularly used in England. *The Book of Common Prayer* was composed of various elements. The Scot., Irish, and Amer. Churches are the Anglican l. with certain modifications. L's are used by Calvinists and Lutherans, but not by Presbyterians nor the majority of Eng. Nonconformists.

LITVINOV, MAXIM, former name Finklestein, a Russian of Jewish origin; was employed in the office of a London publisher, and during the World War became prominent in Russian revolutionary circles; appointed by the Bolshevik government 'provisional plenipotentiary in London of the People's Commissariat for Foreign Affairs' (1918), but was not accorded official recognition by Brit. Government; engaged in propaganda work in favor of a revolution in that country, and was expelled; requested to leave Sweden (Jan. 1919); conducted abortive negotiations at Stockholm for the exchange of Brit. prisoners in Russia (Nov. 1919); peace delegate at Dorpat (Yuriev), Livonia (Dec. 1919); wrote *The Bolshevist Revolution.*

LIVADIA, a township on the S. coast of the Crimea, S. Russia, 3 m. S.W. of Yalta. It has an imperial palace, a favorite resort of the Czar, Alexander II.

LIVADIA (ancient *Lebadeia*), a town in the monarchy of Attica and Bœotia, Greece, on Lamos, near Lake Copais, 52 m. N.W. of Athens. Lebadeia was famous for its subterranean oracle of Trophonios. The modern town manufactures cotton goods, and has a trade in rice, grain, and oil. Pop. 6,500.

LIVER, large vascular gland, of a reddish brown color, situated in the upper right part of the cavity of the abdomen, behind the ribs, the largest gland in the human body, weighing about 3 lb. The upper and anterior surface is in contact with the diaphragm and the anterior abdominal wall, while the lower and posterior surface, to which the gall bladder is bound down by peritoneum, is divided into several lobes by fissures, and is in contact with the stomach, duodenum, colon, right kidney and suprarenal body, and other neighboring structures, and is grooved by the œsophagus and vena cava. In regard to its minute structure, the l. is composed of a great number of lobules of distinctive polygonal hepatic cells, and the portal vein divides into minute branches which again ramify round each lobule, from which other venous capillaries run to a central vein in the middle of the lobule, which joins other similar veins, becomes the hepatic vein, and eventually enters the venacaba.

The functions of the l. include the breaking down of worn-out blood corpuscles, and the secretion and excretion of bile, which is a digestive fluid acting on fats and making them more easily absorbed, while the l. is also a great storehouse of nutriment for the body, carbohydrates and proteids absorbed

after a meal in a soluble form in the blood being held up in liver-cells in the form of *glycogen*, which is set loose when the body requires it.

LIVERMORE, MARY ASHTON (RICE) (1821-1905), American reformer; *b.* in Boston, December 19, 1821; *d.* in Melrose, Mass., May 23, 1905. She married the Rev. D. P. Livermore, a Unitarian clergyman, and became an earnest antislavery and temperance advocate. After the Civil War she lectured on woman's suffrage and temperance with great success throughout the country. With Frances E. Willard she edited 'American Women.' Her best known lectures were *What Shall We Do With Our Daughters* and *Women of the War*. Author of *Pen Pictures*, 1865; *Thirty Years Too Late*, *My Story of the War* and *Story of My Life*, 1897.

LIVERPOOL, city and co. bor., Lancashire, England (53° 25′ N., 2° 59′ W.), on Mersey; greatest seapt. on W. coast, with nineteen public graving docks; served by seven railway systems; a railway tunnel and ferry steamers cross Mersey to Birkenhead; connected with Manchester by Ship Canal, with E. coast by Leeds and Liverpool Canal; accounts for one-fourth of imports and two-fifths of exports of U.K., the total net tonnage of arriving and departing vessels, apart from coasting trade, totalling over 18,000,000 in 1916. Chief imports are raw cotton, wheat, livestock, wool, tobacco, foodstuffs; chief exports, iron and steel, manufactures, textiles, chemicals, machinery, silk, woolen, and linen goods. Principal industries are shipbuilding, with associated iron and brass industries, flour and rice milling, sugar refining, manufacture of tobacco, glass, chemicals, chain cables, and anchors.

Liverpool is episc. see of Anglican and R.C. churches; foundation-stone of Prot. cathedral was laid in 1904 by Edward VII.; School of Tropical Medicine; univ.; formerly affiliated to Victoria Univ., Manchester, was incorporated in 1903. Public buildings include St. George's Hall, good example of 19th cent. Renaissance style, which contains assize court and great hall; Walker Art Gallery, built 1877, which has fine collection, including several old paintings by Dutch and Ital. masters; town hall, exchange, public library, museums, many charitable establishments. Liverpool received its first charter from King John in 1207, and obtained subsequent charters at various dates; was Parliamentary stronghold in Civil War; taken by Prince Rupert (1644); corporation acquired crown rights of manor of Liverpool in 1672 center of slave trade in 18th cent owes much of its importance to openin up of S. Lancashire coalfield and ris of cotton industry. Pop. 746,400.

LIVERPOOL, CHARLES JENKINSON, 1ST EARL (1729-1808 Secretary of Treasury, 1763; Wa Sec., 1778; Pres. Board of Trade, 178 —Robert, 2nd Earl (1770-1828), Fo eign Sec., 1801; Home Sec., 180 War Sec., 1808; Premier, 1812.—Arthu Foljambe, 5th Earl (1870), was cr. Ea of L., 1905; app. Gov. of New Zealand 1912.

LIVERSEDGE (53° 45′ N.; 1° 4 W.), town, W. Yorkshire, England Pop. 15,000.

LIVERY, term descriptive of uniforn worn in mediæval times by retainer of noblemen; custom abolished b Henry VII.

LIVERY COMPANIES, of whic there are seventy-eight in Londor consisted originally of the members the various trades practiced within th City of London. Formerly each trad had its distinctive dress or 'livery'— hence the term liverymen, meanin a member of one of the city trade guild or companies. Admission to thes companies is now a matter of inheritanc or of payment, and all connected wit actual trading has long ceased; but th Livery Companies own considerabl property and administer many charities and the liverymen are freemen of th city, with exclusive power to elect th lord mayor and sheriff.

LIVESTOCK, a term covering suc domestic animals as horses, cattl sheep, hogs and other creatures include in agricultural industry. The productio of livestock has been one of the leadin agricultural industries in the Unite States since colonial days, and especiall since the opening up of the great prair states to cultivation, where condition are especially adapted to raising them In 1922 the U.S. Department of Agr culture estimated the total value livestock on farms in the United State at $4,780,000,000, cattle leading wit a value of $65,352,000, hogs being nex with a value of $56,996,000, followed b sheep, valued at $36,048,000; horse $20,000,000 and mules, $5,436,000. Thes figures of course included all classes such stock, being raised for meat, milc cows, etc. The following figures, issue by the U.S. Census Bureau, for 191 are especially concerned with the liv stock raised for meat, including cattl sheep and swine. The total value animals slaughtered in that yea

amounted to $3,511,201,281. The states contributing to the value of over $200,000,000 were Illinois, Iowa, Missouri, Nebraska and Kansas, Texas falling short of that figure by less than $4,000,000.

LIVIA DRUSILLA (55 B.C.-29 A.D.), wife of Emperor Augustus and mother (by former marriage) of Emperor Tiberius and of Drusus, *f.* of Emperor Claudius.

LIVING CHURCH, THE, a Communist organization of Russian Ecclesiastics formerly belonging to the old Russian Orthodox Church, which was disestablished by the Bolshevists after their seizure of the government in 1917. The Living (or Reformist) Church aimed to mould its ideas to Communism despite the fact that the Bolshevists are unbelievers. It formulated the basis of a new Russian religion to conform to the Soviet system by reorganizing the old Orthodox Church, abolishing bishops, recognizing the authority of the Communist government in Russia, and acceding to the Soviet edict nationalizing all church property. The sect was formed in 1922 and was further organized at an All-Russian Church Congress held in Moscow, in May, 1923.

LIVINGSTON, a city of Montana, in Park co., of which it is the county seat. It is on the Northern Pacific Railroad and on Yellowstone river. It is an extensive stock raising and agricultural community. It is the headquarters of a railroad division and has machine shops, lumber mills, lime works, etc. The public buildings include a library and a high school. Pop. 1920, 6,326.

LIVINGSTON, EDWARD (1764-1836), U.S. Secretary of State (1831-3) and Ambassador; *b.* Clermont, N. Y.; *d.* Rhinebeck, N. Y. He was a student at Princeton and became a lawyer in 1785, practicing in New York City, where he acquired a high repute in his profession. He represented the State in Congress from 1795 to 1801, when he became United States Attorney. In the same year he also served as Mayor of New York City. Misappropriation of government funds by a subordinate while he held the office of federal attorney led to a suit against him for recovery and to his voluntary acknowledgment of judgment for $100,000 entered in the government's favor. The amount he subsequently repaid in full, but he determined to abandon New York, renounced his law practice and resigned both his offices. He settled in New Orleans, in 1804, where he soon built up an extensive practice. At the battle of New Orleans in the War of 1812 he served as General Jackson's staff and headed the city's committee of public defense. From 1822 to 1831 he represented Louisiana in Congress in both houses. His great achievement, which brought from Sir Henry Maine the tribute that he was the 'first legal genius of modern times,' was his revision and codification of the criminal law of Louisiana. The work was published as *A System of Penal Law*, and, though never wholly adopted by the State had features which were embodied in the codes of other States and even by some European governments. While Secretary of State under President Jackson (1831-3) he earned further note as the author of the *Nullification Proclamation of 1832*. Jackson sent him to France in 1834 as Ambassador to collect some $5,000,000 from the government to indemnify American commerce for French depredations, and he succeeded in his mission of obtaining payment. His *Criminal Jurisprudence* (2 vols.) was published in 1873 and a biography of him by Carleton Hunt appeared in 1903.

LIVINGSTON, ROBERT R. (1746-1813), an American jurist and statesman, bro. of Edward L. He was called to the bar in 1773, and was Recorder of New York from 1773-75. He was a member of Congress, and a member of the committee which drew up the 'Declaration of Independence,' as well as of the committee which drew up the first constitution of the state of New York, of which he was the first chancellor (1777-1801). At the same time he was Secretary for Foreign Affairs (1781-83), and president of the New York Convention (1788). From 1801-4 he was ambassador to France, and negotiated the purchase of Louisiana. He was an ardent agriculturist, introducing the use of gypsum as a fertilizer, and, in conjunction with Robert Fulton, did much to further the experiments with steam navigation.

LIVINGSTON, WILLIAM (1723-90), Amer. politician; attended first and second Continental Congresses, 1774-1776; Gov., New Jersey, 1776. *Bro's*, Peter and Philip, Whig leaders; *s*,. Henry Brockholst, officer, War of Independence.

LIVINGSTONE, DAVID (1813-73), Scot. missionary and African explorer; *b.* Blantyre, Lanarkshire; at ten years of age worked fourteen hours daily in factory, studying at night; took courses of med. and theol. at Glasgow Univ.; medical missionary to Africa, 1840-56; discovered Lake Ngami, 1849; traversed

Africa from Zambesi to Congo, 1853-54, returning 1855-56; pub. *Missionary Travels and Researches in S. Africa*, 1857; Brit. consul to Portug. possessions in S. Africa, 1858; discovered Lakes Shirwa and Nyassa, 1859; commenced search for source of Nile, 1866; after terrible journey reached Zambesi, Jan. 1867; during 1867 discovered watershed between Loanga tributary of Zambesi and other rivers (the Chambeze most important) flowing N., and believed Chambeze to be source of Nile; explored until finally, broken down, took refuge at Ujiji; many search expeditions failed; found by Stanley, 1871; continued exploration of Chambeze till death at Itala.

LIVIUS ANDRONICUS (*c.* 284-204 B.C.), the founder of Rom. epic poetry and drama; translated the *Odyssey* into Lat. Saturnian verse.

LIVNO (43° 44′ N., 17° 7′ E.), fortified town, on Bistritza, Bosnia. Pop. 5,400.

LIVONIA, province of Russia; named from early inhabitants, *Livs*; situated on shores of Baltic; area, over 18,000 sq. miles; first hist. mention XI. cent.; Christianized, XII. cent., and received bishopric; divided between Russia and Poland, 1561; completely annexed by Poland, 1582; seized by Sweden, 1621, in order to obtain access to ocean; acquired by Peter the Great, 1721.

LIVORNO, Ital. name for Leghorn (*q.v.*).

LIVY, TITUS LIVIUS (59 B.C. to 17 A.D.), Rom. historian; *b.* at Patavium (Padua), Italy; lived chiefly in Rome; well versed in Gk. lit., rhetoric, and philosophy; sympathized with Pompey in Civil War; visited Campania; befriended by Augustus, although republican in politics; gained fame by his great work, *History of Rome*, probably written, 27-20 B.C. On Tiberius becoming emperor, withdrew to Padua, where he died; had one *s.*, one *dau.*

His great work, properly called *Ab urbe condita libri*, deals with history of Rome from landing of Æneas, and founding of city to death of Drusus, 9 B.C.; written in 142 parts or *libri*, of which 35 are still extant, while epitomes of most of others also exist. First 15 *libri* narrate history down to beginning of war with Carthage; next 15 describe two Punic wars, conquest of Macedonia, Gracchus' administration, Sulla's dictatorship, death of Cæsar, civil wars, battles of Philippi and Actium, and twenty years of Augustus' reign are all subsequently described.

LI YUAN HUNG (1864), a Chinese statesman. He was educated to th naval service and afterwards entere the army. He took part in organizin military forces and commanded th revolutionary troops at Wu Chang, 1914. He was elected vice-presider of the newly established republic und Yuan Shi-Kai. After the latter's deat in 1916 he succeeded to the presidenc Soon after assuming office he becan involved in difficulties with the legi lative branch of the government. H dissolved Parliament. This action wa declared to be arbitrary and six pro inces, under the leadership of Sun Y Sen, revolted, and an effort was made t establish a monarchy. Li Yuan Hun was thoroughly frightened and refuse to resume his office. He was succeede by Hsu-Shih-Chang in 1918. He r sumed the presidency in 1922, bu again fled in June, 1923.

LIZARD POINT, THE LIZARD (49 57′ N., 5° 12′ W.), most southerly poi in England, on S. Cornish coast.

LIZARDS (*Lacertilia*), one of th orders of the Reptilia, containing abou 1700 species; usually four-limbed; eith or both pairs of limbs may be absen (*e.g.*) Glass Snake, Slow Worm, etc., bu vestiges of the shoulder and hip girdl are always present. Unlike that snakes, the lower jaw is rigid, the ey lids are generally movable, and extern ear-openings are present. Regeneratio of a lost limb or of the often very britt tail is common. Though many bi severely, poison glands occur only i the Amer. Heloderms. The diet usually worms and insects, but the large forms eat frogs, mice, and small bird while other lizards are vegetaria From 20 to 30 soft-shelled eggs are lai usually, but some forms are viviparou The majority are terrestrial, thoug some are arboreal, and others sem aquatic; one only is marine, the Gala pagos Sea Lizard.

Hibernation occurs in the colde regions, in Europe lasting from 6 to months, but many species in warme regions pass the hottest season in torpid state. These usually activ graceful and beautifully colored anima are of world-wide distribution. They ar most abundant in the tropics, but ar absent from the polar regions.

According to Gadow there are thre sub-orders: (1) Geckones (Geckos); (2 Lacertæ (typical Lizards); (3) Chama leones (Chamæleons).

LLAMA. See CAMEL FAMILY.

LLANBERIS (53° 6′ N., 4° 5′ W. town, Carnarvonshire, N. Wales; slat quarries. Pop. 3,000.]

LLANDAFF (51° 29′ N., 3° 14′ W.), town, Glamorganshire, Wales; episcopal see; cathedral, ruined episcopal palace; practically a suburb of Cardiff. Pop. 6,000.

LLANDILO, LLANDEILO (51° 53′ N., 3° 59′ W.), town, Carmarthenshire, Wales; in neighborhood are ruins of Dynevor Castle. Pop. 2,000.

LLANDOVERY (51° 59′ N., 3° 48′ W.), town, Carmarthenshire, Wales; ruined castle; manufactures beer. Pop. 1921, 1,932.

LLANDOVERY GROUP, the lowest division of Silurian system in Britain; divided into Lower and Upper l. g.; formed of conglomerates, sandstones, etc. At Llandovery (*q.v.*) they rest uncomfortably in the ordovician rocks. The Lower group has many fossils, including graptolites, trilobites, brachiopods. L. rocks used for building and flag-stones and slate-pencils.

LLANDRINDOD, LLANDRINDOD WELLS (52° 15′ N., 3° 22′ W.), town, Radnor, Wales; mineral springs. Pop. 3,000.

LLANDUDNO (53° 20′ N.; 3° 52′ W.), town, Carnarvonshire, N. Wales; summer resort. Pop. 11,000.

LLANELLY (51° 42′ N., 4° 9′ W.), port, Carmarthenshire, Wales; copper works. Pop. 1921, 36,504.

LLANES (43° 26′ N., 4° 46′ W.), port, N. Spain. Pop. 22,000.

LLANQUIHUE (41° S., 72° 50′ W.), S. province, Chile, S. America; area, 45,513 sq. miles; contains Lake L.; surface mountainous, well forested; produces lumber, cereals. Pop. 1920, 137,206.

LLORENTE, JUAN ANTONIO (1756-1823), Span. ecclesiastic; wrote history of Inquisition.

LLOYD, ARTHUR SELDEN (1857), Bishop. *b.* in Alexandria county, Virginia. Educated at Virginia Polytechnic Institute, University of Virginia and Theological Seminary of Virginia. Doctor of Divinity 1898 of Roanoke College, 1915 University of the South. 1880 Deacon, 1881 priest of the Protestant Episcopal Church. 1900-1909 general secretary of Domestic and Foreign Missionary Society of the Protestant Episcopal Church in United States of America. 1909 consecrated bishop coadjutor of Virginia. Since 1910 president, Board of Missions, Protestant Episcopal Church. 1921 Suffragan Bishop diocese of New York.

LLOYD, HENRY DEMAREST (1847-1903), an American publicist; *b.* in New York City. He graduated from Columbia University in 1867, studied law, but instead of practicing took up journalism, being for thirteen years on the editorial staff of the Chicago Tribune. After 1885 he traveled extensively, studying industrial conditions in Switzerland, Great Britain, New Zealand and other countries. While not actually a Socialist, he was an advocate of what he called industrial democracy, and wrote many articles on such matters as labor co-partnership, co-operation and industrial legislation. Among his books are *A Country Without Strikes*, 1906; *A Study of Swiss Democracy*, 1907 and *Lords of Industry*, 1910.

LLOYD GEORGE, DAVID. See GEORGE, DAVID LLOYD.

LLOYD'S, an association of persons engaged in marine insurance. Took its name from the fact that the members formerly met at Lloyd's Coffee-House in Lombard Street, London; incorporated, 1871, with the object of marine insurance. Members are required to deposit securities for $25,000.

LOAD LINE, a line 18 in. long, drawn through a circular disc, 12 in. in diameter, painted on a vessel to indicate the depth to which a vessel is allowed to sink in salt water, according to law, after being loaded. It was enacted, through the influence of Mr. Plimsoll, that every British ship must be so marked, amidships, by the Merchant Shipping Act of 1876.

LOAM, a soil mixture of sand and clay; the preponderance of one or the other makes the L. light or heavy in texture. Heavy Ls. need to be well manured with stable manure to improve the texture, and lime is necessary at intervals to make the fertilizing elements available for plants. Light Ls. are easily worked and need no draining, the manuring is done especially with the object of keeping them moist and cool. L. forms the principal part of the compost used for pot plants, the best is an equal mixture of sand and clay with an abundance of fibre, and is usually the top 3 or 4 in. from old pasture land. All loamy soils are well suited for farming and general gardening, those with sand preponderating are best for early crops. Clay Ls. are better for late crops.

LOAN AND TRUST COMPANY. A corporation legally authorized to act as trustee, or to execute trusts of various description. Generally, a corporation organized under trust corporation laws need not do a trust business, being

granted other powers according to state laws, but banking in some form is carried on. Most of the newly organized trust companies serve as banks of deposit and discount, or saving banks, or both. Trust companies perform the same service as individual trustees, for individuals, corporations, public, and private, and through court appointments. They manage real, or personal property, collect rents, pay insurance, care for dividends, etc., invest the funds of institutions, collect income, make loans, and care for the property of absentees, and nearly all have safe deposit vaults in which clients may rent boxes, or compartments, for storing valuables. Among other services the trust company may act as financial agent for states, cities, and railroads, have charge of the payment of dividends and act as trustees of underwriting syndicates. They also may finance and reorganize companies. Banking powers of trust companies, once limited, are now in most states generally the same as banks except they cannot issue notes. In most states Trust companies do a large probate business with the courts as executors of wills, or administrators for minors, or incompetent persons, as depositories of court funds, and as receivers, and trustees, in bankruptcy. The first trust company in the United States was the Farmers Fire and Loan Company (now the Farmers Loan and Trust Company), New York, established in 1822. In 1921 the Treasury Department received reports from 1474 loan and trust companies in the United States.

LOAN ASSOCIATIONS. See BUILDING AND LOAN ASSOCIATIONS.

LOANDA, ST. PAUL DE (8° 49′ S., 13° 6′ E.), port, Angola, Portuguese W. Africa; exports rubber, ivory, palm oil, coffee; has observatory and episcopal palace. Pop. *c*, 20,000.

LOANGO (4° 30′ S., 12° E. port and coast region, W. Africa; formerly center of slave trade; exports rubber, palm oil.

LOBANOV - ROSTOVSKI, ALEXIS BORISOVICH, PRINCE (1824-96), Russ. politician; entered diplomatic service, 1844; ambassador to Constantinople, 1878, France, 1879, Vienna, 1882; foreign minister, 1895; revived Russian influence in the Balkan states.

LÖBAU.—(1) (51° 6′ N., 14° 40′ E.), town, Saxony, Germany; textile, buttons. Pop. 12,000. (2) (53° 41′ N., 19° 45′ E.), town, Prussia, Germany. Pop. 5500.

LOBBY, a term in American politics signifying to loiter in the lobbies of political committees and deliberati assemblies for the purpose of influenci members. In many states it is now felony.

LOBE, a rounded projection; anatomy, a rounded division, mark off by fissues, of the liver or brain, al the lower part of the external ear; botany, rounded division of a leaf, al the pod of a leguminous plant.

LOBELIA, a commonly cultivate genus of the Campanulaceæ, whi differs from the majority in possessi of a zygomorphic flower. One specie *L. dortmanna*, grows submerged lakes, only the flowering shoot appea ing above water.

LOBENSTEIN (50° 27′ N., 11° 3 E.), town, Reuss, Germany. Pop. 3,00

LOBO, JERONIMO (1593 - 167 Portug. missionary in India.

LOBOS or **SEAL ISLANDS,** thr islands in the Pacific Ocean, off the coa of Peru. The largest is 10 miles from t mainland, about 5 miles wide, and miles broad. They are uninhabited a the only product obtained is guano.

LOBOSA, a group of Amœbo Rhizopods—minute Protozoa with clear external coat of protoplasm a with body processes (*pseudopodia*) whi do not branch, (*e.g.*) the named Amœb and freshwater Pelomyxa, and Difflug protected by a shell built up of forei particles.

LOBSTERS, the true Lobsters a Crayfishes (*Nephropsidea*) are disti guished by their large pincer claws fro their relations, the Rock or Spi Lobsters (*Scyllaridea*). The Common frequents rocky portions of the coa and is much esteemed as food, extensi 'fisheries' being prosecuted where occurs in abundance.

LOCARNO (46° 10′ N., 8° 48′ E town, Switzerland. Pop. *c*. 4000.

LOCHABER (56° 57′ N., 4° 45′ W mountainous region. Inverness-shi Scotland.

LOCHES (47° 7′ N., 0° 59′ E town, Indre-et-Loire, France; contai noted castle, in donjon on which Lud vico Sforza, Duke of Milan, was i prisoned in XVI. cent. Pop. 5,000.

LOCHGELLY (56° 8′ N., 3° 18′ W town, Fifeshire, Scotland; coal, iro Pop. 9,500.

LOCHGILPHEAD (56° 2′ N., 5° 2 W.), town, Argyll, Scotland; herri fisheries.

LOCHMABEN (55° 8′ N., 3° 27′ W

town, Dumfriesshire, Scotland; in neighborhood are ruins of L. Castle. Pop. 1920, 1000.

LOCK, a construction whereby vessels can be transferred from one reach of a river or canal to another at a different level. It consists of a small dock connecting the two reaches by gates, each containing a sluice by means of which the water in the l. can be leveled to that of either reach. A boat, suppose in reach A. wishes to enter reach B, which is at a higher level. The water in the l. is first leveled to that of reach A and the communicating gate opened; the vessel enters and the gate is closed. Through the sluice in the second gate, the l. is now filled to the higher level, and the second gate opened; the boat can then pass into the upper reach. L's enable vessels to navigate far inland to parts considerably above sea-level.

LOCK, a lock is a fastening which consists of a bolt held by one or more movable parts in a certain position, and requiring a key which will manipulate these movable parts in the required way, before they can be moved. The most primitive forms of fastening were by means of knotted thongs or a wooden or metal bar placed across the inside of a door. The modern lock is the product of evolution from such a bar, sliding in staples and entering a hole in the door post.

LOCKE, JOHN (1632-1704), Eng. philosopher; *s.* of a Puritan who fought in Civil War; ed. at Westminster School and Christ Church, Oxford, becoming tutor there, 1660. He was influenced by the philosophy of Descartes, became interested in theol., and then studied med. and politics. In 1666 he became sec. to Lord Ashley (later Earl of Shaftesbury), and remained so till Shaftesbury's imprisonment, 1681. He was in France, 1675-79. Suspected by the government, he fled to Holland, and returned to England in 1689. His *Essay Concerning Human Understanding* which appeared in 1690, had been in his mind for years. His *Epistola de Tolerantia* was pub., 1689, likewise *Two Treatises on Government*. In 1691 he pub. *The Reasonableness of Christianity as Delivered in the Scriptures*. He was a commissioner on the Board of Trade, 1696-1700. In his later years he mostly studied theol., and wrote theological and other works.

LOCKE, WILLIAM JOHN (1863) Eng. novelist; *b.* Barbados; Secretary, Royal Institute of Brit. architects (1897-1907); author of *The Beloved Vagabond*, 1906; (dramatized 1908), *Simon the Jester*, 1910; *Stella Maris*, 1913; *The Fortunate Youth*, 1914; *The Wonderful Year*, 1916; *The Red Planet*, 1917; *The Rough Road*, 1919; *The House of Baltazar*, 1920; *The Tale of Triona*, 1922; also plays, *The Palace of Puck*, 1907; *The Man from the Sea*, 1910; etc.

LOCKERBIE (55° 7′ N., 3° 21′ W.), town, Dumfriesshire, Scotland; annual lamb fair. Pop. 3,000.

LOCKHART, GEORGE (1673-1731), Scot. politician and author; of distinguished Lanarkshire family; arrested for part in rising of 1715, but liberated; continued to intrigue with Pretender till death; *Memoirs*, etc., important sources of Scot. history.

LOCKHART, JOHN GIBSON (1794-1854), Scot. writer; *b.* Cambusnethan, near Wishaw; studied for the Bar; became one of the chief contributors to *Blackwood*. His *Lives* of Burns, Napoleon, and Scott are masterpieces.

LOCK HAVEN, a city of Pennsylvania, in Clinton co., of which it is the county sea. It is on the Pennsylvania and Erie railroads and on the west Branch canal. It is situated in a beautiful valley surrounded by mountains and is a favorite summer resort. The chief industries are the manufacture and shipping of lumber. It is the seat of the State Normal School and has foundries, tanneries, machine shops, planing mills and saw mills. The river is here spanned by a bridge. Pop. 1920, 8,557.

LOCKJAW. See PARASITIC DISEASES (*Tetanus*).

LOCKPORT, a city of New York, in Niagara co., of which it is the county seat. It is on the New York Central railroad, and on the Erie canal. The name of the town is derived from ten great locks of the canal which here make a descent of 66 feet. The canal furnishes water power which is utilized by the lumber and flour mills, machine shops, foundries, cotton and woolen mills and other industrial establishments. The canal passes through a deep cut several miles in length, excavated in the solid rock. Lockport is the chief trading center for the county. It has a Female Seminary, public library and several public buildings. In the neighborhood are valuable quarries of limestone and sandstone. Pop. 1920, 21,308.

LOCKROY, EDOUARD (1838), Fr. journalist and politician; deputy, 1871; Minister of Commerce, 1886; Education, 1888; Marine, 1895-96, 1898-99.

LOCKWOOD, BELVA ANNE (1830-1917). American lawyer, *b.* in Royaltown, N.Y. She was active in the woman suf-

frage movement and in other movements affecting women. She was largely instrumental in inducing Congress to pass a law giving equal pay to men and women in government offices. In 1879 she was admitted to the bar in Washington. In 1884 and 1888 she was the nominee of the Equal Rights Party for president. She was delegate to several arbitration and peace conventions in Europe.

LOCLE, LE (47° 4′ N.; 6° 45′ E.), town, Switzerland; watch manufacture. Pop. 1920, 12,463.

LOCOMOTIVE BOILERS. See BOILERS.

LOCOMOTIVE ENGINEERS, GRAND INTERNATIONAL BROTHERHOOD OF. See BROTHERHOODS, RAILROAD.

LOCOMOTIVE FIREMEN AND ENGINEMEN BROTHERHOODS. See BROTHERHOODS, RAILROAD.

LOCOMOTIVES.—Among the various amazing developments of the 19th century, that of the modern locomotive must be cited as one of the most remarkable. Early in the 19th century the first adhesion locomotive was put to work by Blackett of Wylam colliery, although in 1803 Trevithick and Blenkinsop employed a rack, being under the impression that the adhesion would be insufficient to move a trailing load. Space does not permit of an elaborate description of the locomotives employed on the early R., such as the 'Rocket'. The weight of such engines was only a few tons, while today nearly all lines in this country have locomotives which can turn the scale at 100. The trade boom after the Franco-Prussian War was responsible for an enormous increase in R. traffics, and to cope with this the locomotive engineers had to produce larger engines, and the civil engineers stronger bridges and stronger and heavier permanent way. The modern steam locomotive may be viewed as a complete power plant on wheels, converting the energy liberated in the burning of the fuel into mechanical energy which is utilized in driving the locomotive with its attendant train of cars. The heat resulting from the combustion of the fuel in the firebox transforms the water in the boiler into steam. The continuous generation of steam causes the formation of a pressure in the steam space above the water. The steam at this pressure is conveyed to cylinders in which it is allowed to expand, thus effecting a movement of the piston; this in turn is transmitted through piston and connecting rods to the driving wheels. The locomotive of today consists of a horizontal fire tub boiler with the necessary fire-box, grate flues, etc. Superheaters and economizer are sometimes placed in the flues s that the heat may be used to the bes advantage. The steam is utilized i horizontal double acting cylinders, whic may be either simple or compound. Th usual piston and piston rod joins wit a connecting rod which acts directl on the driving wheels. In some case as many as six of these are used on eac side, all being connected together b connecting rods. Valve gears of variou kinds, regulated from the engine cab ar used to control the flow of steam to th cylinders. The usual accessories ar injectors or feed pumps to force wate into the boiler; feed water heaters to hea the feed water by means of exhaus steam; turbine driven electric generator for supplying the headlight, etc. an steam driven air compressors to actuat the brakes on the locomotive and attend ing train of cars. The classification Mr. F. M. Whyte has been generall accepted for American locomotive He designates each type by a series f figures composed of, one figure indicatin number of leading truck wheels, a secon figure indicating the number of drivin wheels and a third figure indicating th number of trailing truck wheels. Th tender is not considered in the classifica tion. The names and classification according to this system, of the mos common American locomotives are,- Consolidated, for heavy freight duty 1-4-0; Mikado, for heavy freight servic 1-4-1; Decapod, for heavy freight moun tain service, 1-5-0; Mallet, (which is compound articulated type) for heav slow freight duty, 1-6-1; Atlantic, fo passenger service, 2-2-1. A partia specification of several large America Locomotives of recent design follows,- Pacific (mountain type), coal and o fuel, boiler pressure 200 lbs. sq. in cylinders 28″ x 28″, tractive effo 54,100 lbs. — Mikado, coal fuel, boil pressure 180 lbs. sq. in. tractive effo 52,200 lbs. total weight 472,000 lbs.- Heavy Mikado, coal fuel, boiler pressu 190 lbs. sq. in. cylinders 27″ x 32″ tra tive effort 60,000 lbs. total weight 320 000 lbs.

LOCOMOTIVES, COMPRESSE AIR. See COMPRESSED AIR LOCOMOTIVES.

LOCOMOTOR ATAXIA, TABE DORSALIS, disease associated wit progressive degeneration of the posteri columns and nerve roots of the spin cord. There are three stages: at fir lightning pains in the legs, constrictin pains round the body, loss of sensibilit in the legs, etc.; then unsteadiness, lo

of muscular tone, a distinctive stamping gait, eye disturbances, and derangements of internal organs; while in the most advanced stage there is paralysis, the patient being unable to walk. The causes are syphilis (most generally), and injury or exposure to extreme temperatures. The progress of the disease may be arrested at an early stage, even advanced cases may improve, but complete recovery is practically impossible.

LOCUST (*Pachytylus cinerascens, P. migratorius*, etc.), members of the Acridiidæ (*Orthoptera*) allied to the Grasshoppers (*Grillidae — Locustidae*) which are migratory in character, and voracious vegetable feeders. They migrate in vast numbers, removing every particle of plant tissue they encounter, with the result that they often produce famine, and, on the putrefaction of their bodies, disease. Various species are found in N. America, the Antipodes, S. Africa, and other regions of the world—the locust of the Biblical 'plagues' probably being *Schistocerca peregrina*, which ranges from N. Africa to Southern India.

LOCUST TREE. See ACACIA.

LODESTONE. See MAGNET.

LODGE, GEORGE CABOT (1873-1909), an American poet, *s.* of Henry Cabot Lodge. After studying at the University of Paris he served in the Spanish-American War and acted as private secretary for his father until his death in 1909. He was highly talented.

LODGE, HENRY CABOT (1850), historian and U.S. Senator. *b.* in Boston, Graduated from Harvard 1871; Law School 1874; editor North American Review, 1873 - 76. Lecturer on American History, Harvard, 1876-79; editor International Review, 1879-81. House of Representatives, Mass. 1880-81, Congress 1886-93 and U.S. Senator 1899-1905-1911, 1917, 1923. Chairman Republican Convention 1900. Chairman committee on resolutions Chicago Republican Convention, 1904; Permanent Chairman Republican National Committee, 1908; Member Alaska Boundary Commission; Regent Smithsonian Institute 1886, 1893, and 1905. In politics a conservative Republican. Principal works, *Short History of the English Colonies in America*, 1882; *Life of Alexander Hamilton*, 1883; *Life of Daniel Webster*, 1885; *Studies in History*, 1889; *History of Boston*, 1895; *Hero Tales of American History* (with Theodore Roosevelt) 1897; *Speeches and Addresses*, 1884-1909, 1913; *Early Memories*, 1915; *100 Years of Peace*, 1915.

LODGE, SIR OLIVER JOSEPH (1851), Brit. physicist and author; was prof. of physics at Liverpool Univ. 1881-1900, and principal of Birmingham Univ. 1900-19. His purely scientific work has been supplemented by excursions into the field of spiritualism and psychical research. He was president of the Society for Psychical Research, 1901-4, and of the British Association, 1913-14. He was knighted in 1902. In 1919 he received the Albert Medal of the Royal Society of Arts as the pioneer in wireless telegraphy. He lectured in the United States in 1920. His works, which cover a wide range—scientific, psychical, sociological—include *Modern Views of Electricity*; *Pioneers of Science*; *Signalling across Space without Wires*; *Modern Problems*; *The War and After*; *Raymond, or Life and Death*; and *Christopher, a study in Human Personality*.

LODGE, THOMAS (*c.* 1558-1625), Eng. dramatist; a noted reprobate and wit at Lincoln's Inn; romance *Rosalynde* furnished Shakespeare with the plot for *As You Like It*; his dramas, *The Wounds of Civil War* and *A Looking-Glass for London and England*, are poor.

LODI (45° 18′ N., 9° 29′ E.), town, Piedmont, Italy; seat of bishopric; has Romanesque cathedral dating from 1158; dairy produce. Here Napoleon defeated Austrians, 1796. Pop. *c.* 28,000.

LODI, a borough of New Jersey, in Bergen co. It is on the New York, Susquehanna and Western railroads, and on the Saddle river. Its industries, which are important, include dyeing of silk, and the manufacture of rubber goods and car equipment. Pop. 1920, 8,175.

LODZ (51° 46′ N., 19° 33′ E.), town, Russ. Poland; cottons. Pop. 1921, 451,813.

LOEB, JACQUES (1859), University professor, *b.* in Germany. Studied medicine at Munich and Berlin. Doctor of Medicine 1884, Strassburg, 1886-88 assistant in physiology, University of Wurzburg; 1888-90 University of Strassburg. 1895-1900 associate professor; 1900-2 professor, University of Chicago; 1902-10 professor physiology, University of California. Since 1910 head of division general physiology, Rockefeller Institute for Medical Research. Author of, *The Heliotropism of Animals and Its Identity with the Heliotropism of Plants*: Wurzburg, 1890. *Physiological Morph-*

ology 1, 1891; 2, 1892. *Comparative Physiology of the Brain and Comparative Psychology*, 1900. *Studies in General Physiology*, 1905; *Dynamics of Living Matter*, 1906; *The Mechanistic Conception of Life*, 1912; *Artificial Parthenogenesis and Fertilization*, 1913; *The Organism as a Whole*, 1916; *Forced Movements, Tropisms and Animal Conduct*, 1918. Numerous papers on physiological and experimental biology.

LOEB, LEO (1869), pathologist. *b.* in Germany. 1889-96 studied medicine and natural science at Universities of Zurich, Freiburg and Berlin. 1903 research fellow, McGill University; 1900-1 adjunct professor pathology, University of Illinois, experimental pathologist, New York State Pathological Laboratories, 1902. 1904-10 assistant professor of experimental pathology, University of Pennsylvania. 1910-15 director of department of pathology Barnard Skin and Cancer Hospital, St. Louis. Since 1915, professor of Comparative pathology, Washington University.

LOESS, in geology, loamy deposit of fine sand occurring in alluvial deposits of Pleistocene system; found in valleys of Danube, Rhone, Rhine, and Missouri. Fossils found in it are land and freshwater shells; Pleistocene mammals comprise mammoth, rhinoceros, and reindeer, and man.

LOFOTEN AND VESTERAALEN (*c.* 68° 40′ N., 15° 20′ E.), chain of islands belonging to Norway, stretching along N.W. coast; mountainous; sheep raised; great cod-fisheries; exports cod, cod-liver oil, roe, herring. Pop. *c.* 43,000.

LOG, instrument for measuring a ship's speed; modern l., towed from stern, registers by means of fly-wheel. Log-Book, journal of occurrences on board ship; kept by navigating officer.

LOGAN, a city of Ohio, in Hocking co., of which it is the county seat. It is on the Hocking Valley Railroad and on the Hocking river. It is the chief trade center for an important natural gas and oil region. Its industries include foundries and machine shops, flour mills, furniture factories, brick works, etc. The public buildings include a public library and a hospital. Pop. 1920, 5,493.

LOGAN, a city of Utah, in Cache co., of which it is the county seat. It is on the Oregon Short Line railroad and is near the Logan river. Its industries include beet sugar factories, condensed milk factories, knitting mills, flour mills and saw mills. It is the seat of the State Agricultural College, Brigham Young College and the New Jersey Academy. The public buildings include a Federal building and a court-house. Pop. 1920, 9,439.

LOGAN, JOHN ALEXANDER (1826-86), Civil War general and senator; *b.* Jackson County, Ill.; *d.* Washington, D.C. He fought in the Mexican War of 1846 as a youth of twenty, after a primary education at Shiloh College, and from a private became first lieutenant. After the war he continued his education, graduating from Louisville University, and studied law. He entered the Illinois legislature in 1852, served as prosecuting attorney, and went to Congress in 1858 as a Douglas Democrat. In 1861 he was in the army again, resigning his seat to take part in the Civil War as colonel of a regiment of Illinois volunteers. He shared in the fighting at Belmont, Fort Henry, Fort Donelson (where he was wounded), Port Gibson and Raymond, Jackson, Champion Hill, Vicksburg, the fall of Atlanta, and in the Carolinas. In the course of the war he was in command as major-general of the Seventeenth and Fifteenth Corps, and temporarily headed the Army of the Tennessee in 1864. The post-war period found him in Congress again, 1867-71, as a Republican also as one of the participants in the impeachment of President Andrew Johnson, and as Commander-in-Chief of the Grand Army of the Republic, 1868-71. He became U.S. Senator from Illinois in 1871, serving till 1877 and was shortly after re-elected to that chamber, where he made many notable speeches. In 1884 he was a Republican candidate in competition with James G. Blaine for the Presidency, and upon Blaine's nomination was chosen as candidate for Vice-President. With the defeat of the Republican ticket in that year he was again elected to the Senate. Blaine said of him that no man in America had achieved greater distinction in following both a military and legislative career.

LOGAN, MRS. JOHN ALEXANDER (1839-1923), wife of General John A. Logan, to whom she was married in 1856. During the Civil War she frequently visited General Logan at the battle front and was active in relief work among the wounded. Following the death of her husband in 1886 she wrote much on civil subjects. She was also a world-wide traveler and accumulated a valuable group of war trophies. Her son, Major John A. Logan, Jr., was killed in the Philippines in 1899.

LOGANBERRY, a hybrid between raspberry and bramble, first produced

by Judge Logan, an American, in 1881.

LOGANSPORT, a city of Indiana, in Cass co., of which it is the county seat. It is on the Wabash and other railroads and at the junction of the Wabash and Eel rivers. It is the chief trade center of a large farming region. Its industries include flour mills, paper mills, pump works and plants for the making of galvanized iron, linseed oil and agricultural implements. Logansport is the seat of the Northern Indiana Hospital for the Insane. It has a large trade in lumber, pork and agricultural products. Pop. 1920, 21,696.

LOGAR (33° 55′ N., 68° 26′ E.), river, Afghanistan, tributary of Kabul R.

LOGARITHM. The common logarithm of a number is the index to which 10 must be raised to equal that number. Thus 10^3 equals 1000, so that the logarithm of 1000 is 3. Now $10^1=10$, $10^2=100$, $10^3=1000$, $10^6=1{,}000{,}000$, and it is well known that $10^0=1$, $10^{-1}=0.1$, $10^{-2}=0.01$, etc.

From this it follows that the logarithm of a product is the sum of the logs. of the factors; similarly the logarithm of a quotient is log. of dividend–log. of divisor. In this way problems involving multiplication and division become problems of addition and subtraction of logarithms.

Logarithms may be calculated from the *Logarithmic Series*—

$$\log_e(1+y)=y-\frac{y^2}{2}+\frac{y^3}{3}-\ldots+(-1)^{r-1}\frac{y^r}{r}+\ldots \quad (1)$$

where $e=1+1+\frac{1}{2!}+\frac{1}{3!}+\frac{1}{4!}+\ldots=2{\cdot}71828\ldots$

These logarithms are known as *Napierian* or *natural logarithms*, and are used in all theoretical investigations. For purposes of computation, we require logs. to the base 10, which are known as *common logarithms*. It is usual to omit the base 10 in writing. In common logarithms it is convenient to keep the *decimal part always positive*. Thus log. 0·3 is written $\bar{1}{\cdot}4771213$ and not—0·5228787. In this way the decimal part of the logarithms of all numbers consisting of the same digits in the same order is the same, and the logs. only differ in the integral part. When so written, the decimal part is called the *mantissa*, and may be obtained from tables; the integral part is called the *characteristic*, and may be written down by inspection by means of the following rules, decimal notation being used: (1) *The characteristic of the log. of any number greater than unity is one less than the number of figures to the left of the decimal point.* (2) *The characteristic of the log. of any number less than unity is negative and is one more than the number of ciphers immediately to the right of the decimal point.*

Log. tables are published giving to 7 or more places of decimals the mantissæ of the logarithms of all numbers from 1 to 99,999. For numbers of more than 5 significant figures interpolation is necessary, but for practical purposes it is sufficient to employ *simple proportion* in determining intermediate logarithms to those given in the tables.

LOGIA, name given to 'sayings' of Jesus unearthed at Oxyrhynchus in Egypt by Grenfell and Hunt. In 1897 a fragment was found, containing eight sayings; in 1903 some more were found, more mutilated, and in 1907 a fragment of a hitherto unknown Gospel, containing an account of a conversation on purification between Christ and a Pharisee in the Temple. The papyri are III. cent. and the sayings themselves probably II. cent.; most critics think they are not entirely dependent on the canonical gospels, but represent separate traditions; the 'sayings' are quite possibly genuine.

LOGIC as the systematic study of reasoning or thought was created by Aristotle. His logical system is embodied in a number of writings collectively known as the *Organon*, for a discussion of which see under ARISTOTLE.

The history of the Aristotelian logic has been largely a history of degeneration, and for this degeneration the mediæval scholastic logicians were chiefly responsible. To Aristotle the syllogism was the instrument or method of science; to the scholastic theologians it was a method of expounding the dogmas of the Church, and of expanding these into all their remoter consequences and details.

In view of this degradation of the syllogistic logic to a mere formal method of disputation, it is not surprising that thinkers of the modern period, like Bacon and Locke, imbued with the new scientific spirit, should have conceived a strong distaste for such a logic, at any rate as a method of science. This antagonism of the empirical school was not lessened when, later in the modern period, a purely formal conception of logic was expressly put forward and defended on the basis of a rigid distinction between the form and the matter of thought by logicians under the influence of Kant. Such a type of logic was represented in England by Hamilton and Mansel. J. S. Mill, on the other hand, the contemporary repre-

sentative of the empirical school, upheld their traditional view by attacking the syllogism as a *petitio principii*, and developing his own analysis of the inductive methods of scientific proof as a real logic of investigation—a logic of truth as opposed to a mere logic of consistency. And accordingly, in several of the most popular and widely used text-books, written under the influence of Mill's great work, we find a sharp division made between deductive and inductive logic.

But from this condition of things modern logic has tended, and more especially within recent years, to diverge in two opposite directions. The purely formal logic of the formal logicians has given rise to a still more extreme symbolic logic, which attempts to express the processes of thinking by mathematical methods and formulæ. And, on the other hand, philosophical logicians have, in a manner, returned to the genuine Aristotelian standpoint, and, treating logic as the theory of knowledge or science, have revindicated for deduction its true place in logical theory. The translated logics of Lotze and Sigwart have contributed powerfully to the same general tendency to treat logic as a theory of knowledge and scientific method. From such a standpoint logic and epistemology become identical, and no hard and fast line can be drawn between logic and metaphysics. The revival of philosophical logic was due to the influence of German post-Kantian idealism, and partakes of the metaphysical character of the latter; but quite apart from this influence, other important contributions have been made, which are in line with Mill in bringing logic into close relation with science.

LOGOGRAPHERS, Gr. historians who preceded Herodotus; works may be regarded as prose counterparts of epic poems, as sacred histories or pious myths.

LOGOS (Gk. *logos*, 'word,' 'reason'), a philosophical and theological term, found in Hellenic speculation from the time of Heraclitus, who postulated a divine 'logos' corresponding to the human reason, though somewhat material; it appears in Plato, Aristotle, and Stoicism. A similar concept had evolved in Judaism, where an increasing reverence had separated God from the world and an intermediate being was required; His was the divine Word (*Memra*). The greatest exponent of the idea of the L. was Philo, who combined Hellenic and Hebraic elements. In Christian theol. the L. doctrine appears in the Fourth Gospel. Further developments came with Gnosticism.

LOGROÑO.—(1) (42° 15′ N., 2° 4 W.), N. province, Spain; area, 1946 s miles; produces wine, oil, fruit, cereal Pop. 1920, 182,389. (2) (42° 28′ N 2° 33′ W.), capital of above; surrounde by walls; produces wine. Pop. 24,00

LOGWOOD, heart-wood of l. tr (*Haematoxyton campechianum*) of Ce tral America; cut in chips and fermente in heaps, it yields hæmatoxylin, the re coloring matter used in dyes and ink

LOHARU.—(1) (28° 30′ N., 75° 4 E.), native state, Punjab, India. Pop. 17,000. (2) (28° 23′ N., 75° 50′ E. capital of state. Pop. 2700.

LOHENGRIN, the hero of an ol Ger. poem of XIII. cent.; s. of Parsifa and a knight of the Grail; he was carrie by a swan to Elsa of Mainz, and th revelation to her of his origin resulte in their separation; story is theme Wagner's opera *Lohengrin*.

LOIR, a river of France, in th northwestern part. It flows into th Sarthe, a few miles above its junctio with the Loire. The Loir has a tot length of about 180 miles and is partl navigable.

LOIRE (45° 50′ N., 4° E.), depar ment, S.E. central France; area, 185 sq. miles. mountainous; drained b Loire, Rhone; large deposits of coa manufactures iron, steel, machiner textiles, glass, paper. Pop. 1921, 637,13

LOIRE (47° 13′ N., 2° 12′ W. longest river of France; rises in Cever nes, and after flowing some distance N bends to W. and enters Bay of Biscay chief tributaries, Allier, Vienne, Sarth largest towns on banks, Orleans, Tour Angers, Nantes.

LOIRE HAUTE. See HAUTE LOIR

LOIRE-INFÉRIEURE (47° 20′ N 1° 45′ W.), coast department, W France; area, 2693 sq. miles; surfac generally low and flat; drained by Loir produces flax, wine, cider; fishing; coa iron, copper, machinery, shipbuildin Dairy-farming and stock-raising carrie on. Pop. 1921, 649,723.

LOIRET (48° N., 2° 20′ E.), inlan department, France; area, 2629 s miles; surface rises from N.E. to S.E drained by Loire and tributaries Seine; forests; produces great quantitie of wheat and oats; livestock raised manufactures woolens, leather, suga flour. Pop. 1921, 337,224.

LOIR-ET-CHER (47° 40′ N., 1° 2 E.), inland department, France; are

2478 sq. miles; watered by Loir, Cher; produces cereals, fruit, vegetables, timber, wine; horses and sheep bred; manufactures textiles, leather. Pop. 1921, 251,528.

LOISY, ALFRED FIRMIN, ABBE (1857), Fr. R.C. theologian; prof. of Oriental languages and Biblical exegesis. Catholic Institute of Paris (1881-93); lecturer at the Sorbonne (1900-4); prof. of history of religions, Collège de France, since 1909; wrote *L'Evangile et l'Eglise*, 1902, in answer to Harnack's *What is Christianity?*; pub. *Autour d'un petit livre*, *Le Quatrieme Evangile*, 1903; *Les Evangiles synoptiques*, 1908; *Jesus et la Tradition evangelique*, etc.; several of his works condemned by papal see (1903-4); excommunicated (1908).

LOJA.—(1) (37° 11′ N., 4° 12′ W.), town, Spain; ruined Moorish castle; damaged by earthquake, 1885. Pop. 20,000. (2) (4° 10′ S., 79° 15′ W.), province, Ecuador, S. America. Pop. *c.* 66,000. (3) (4° S., 79° 16′ W.), town, Ecuador, S. America. Pop. *c.* 10,000.

LOKEREN (51° 6′ N., 3° 59′ E.), town, Belgium. Pop. 22,000.

LOLLARDS, a term used to describe the mediæval heretics of the XIV. cent. whose greatest leader was Wycliffe. Till then there had been little heresy but grave abuses in the Church had brought about not only a widespread feeling that reform was needed, but a distrust of the entire sacerdotal and sacramental system of Catholic Christianity. The *Act De heretico comburendo* was passed by Parliament in 1401, and William Sawtre was burnt that year. Ineffectual efforts were made to put down Lollardy under Henry IV., and more stringently under Henry V., when Sir John Oldcastle (Lord Cobham) was burnt. Nevertheless Lollardy lingered on, and was finally absorbed into Protestantism, which was partially its offshoot.

LOMBARD COLLEGE. A co-educational institution founded at Galesburg, Illinois, under the auspices of the Universalists. There are two departments, preparatory and classical. The degree of Bachelor of Arts is conferred on graduates in the classical department. The library contains over 8000 volumes. Students, 250. Teachers, 21. President, J. M. Tilden, A.M. LL.D.

LOMBARD LEAGUE, league of L. towns, especially that of 1167, when Cremona, Mantua, Brescia, Bergamo united against Emperor Frederick I., defeating him at Legnano.

LOMBARD, PETER (*c.* 1100-*c.* 1160), an Italian theologian, *b.* at Novara in Lombardy. He is often referred to as 'magister Sententiarum' because of his famous *Sentences*. These are divided into four books, dealing with the Trinity, Creation, Incarnation, and the Sacraments, and were designed to settle doctrinal disputes once and for all by reference always to the scriptural texts. They became after his death the accepted manual of theology.

LOMBARDS, LONGOBARDI, in V. cent. a Teutonic tribe on the Danube; settled in the N. of Italy, A.D. 568, and became an independent kingdom; overthrown by Charles, the Frank king, 774 A.D., and annexed. By the XI. cent. Milan and other Lombard cities were self-governing 'communes'; they suffered the usual vicissitudes of Ital. cities, and in the XIX. cent. Lombardy was released from Austria to become part of the new united Italy of King Victor Emmanuel. In the XIII. and XIV. cent's the Lombard merchants were great bankers and moneylenders, and, though attacked for 'usury,' were safe under the protection of nobles and of Rome itself; since many Lombards acted as agents for the Papal Court. They did a very considerable business with English kings—Henry III., Edwards I., II., and III.—and with the Earls of Derby, Nottingham, Salisbury, and Suffolk. Then in 1345 the two great Lombard houses of the Bardi and Peruzzi became bankrupt—Edward III. owing the former 900,000 gold florins and the latter 600,000—and the Lombards ceased to be the principal bankers.

LOMBARDY (*c.* 45° 30′ N., 9° 30′ E.), division, N. Italy; area, *c.* 9297 sq. miles; includes provinces of Bergamo, Brescia, Como, Cremona, Mantova, Milano, Pavia, Sondrio; contains most of Ital. lakes; crossed by Po and its affluents; produces silk, cereals, wine; manufactures textiles, automobiles, paper; iron, zinc, marble works. Pop. 1915, 4,996,325.

LOMBOK (8° 30′ S., 116° 25′ E.), one of Sunda Islands, Dutch E. Indies; area, *c.* 4000 sq. miles; mountainous, but fertile produces cotton, indigo, tobacco, corn, sugar, coffee. Pop. with Bali, 1,565,014.

LOMBROSO, CESARE (1836-1909), Ital. criminologist; prof. of Psychiatry at Pavia; head of lunatic asylum at Pesaro; prof. of Forensic Medicine and Psychiatry, and afterwards of Criminal Anthropology at Turin; propounded after much research, the theories that the criminal was a special type of the human race, and also that the genius was a degenerate with a close relation to the insane, theories not altogether accepted.

LOMENIE DE BRIENNE, ÉTIENNE CHARLES DE (1727-94), Fr. ecclesiastic and politician; abp. of Toulouse, 1763; pres., Assembly of Notables, 1787 treasurer, 1787.

LOMOND, LOCH (56° 5′ N., 4° 35′ W.), lake, Dumbartonshire and Stirlingshire, Scotland; area, 27 sq. miles; many islands.

LOMZA, LOMZHA.—(1) (53° 5′ N., 22° 8′ E.), government, Poland; area, *c.* 4070 sq. miles; produces cereals,

LONDON, cap. of U.K., and largest city in the world (51° 32′ N., 0° 5′ W). stands on both banks of riv. Thames, which is both tidal and navigable, and which narrows to 325 yds. across a London Bridge. Modern city may be said to have been founded by Alfred on site of a place fortified and walled by the Romans and destroyed successively by Saxons and Danes. Its history has been mainly that of the country.

During the civil wars of 17th cent. London espoused the cause of Parliament; but under the Commonwealth the city suffered considerably at the hands of Cromwell and was glad to welcome Charles II. at Restoration. In 1665 occurred the Great Plague, in 1666 the Great Fire, when, it is said, 13,000 houses, as well as St. Paul's and a great number of churches, were burnt; after this the city was rebuilt, chiefly in brick or stone, and St. Paul's and many other churches were constructed under direction of Wren. Charles II. ruined great number of bankers and merchants by closing the Exchequer in 1672; and towards end of his reign he further alienated the citizens by taking away their charter and himself appointing a lord mayor. This policy was continued by James II. until landing of William of Orange, when too late he restored the charter; the citizens rejected his overtures and sent a formal petition begging William to mount the throne. In William's reign the court was removed to Kensington. Bank of England established in 1694.

In 1709 occurred the Sacheverell riots, and in 1720 the bursting of the South Sea Bubble involved countless families in ruin. The Bank of England was built in 1732-4, and in 1753 the British Museum was founded. The old wall and eight gates were taken down in 1760. In 1805 the docks were opened, and in 1807 gas was first used as means of lighting streets. Cabs came into use from 1823 onwards, omnibuses from 1829. Rebuilding of London Bridge was completed in 1831; and in 1838 the Royal Exchange was burnt, a new building being opened in 1844, in which year also the old debtors' prison of th Fleet was destroyed.

The first mayor of London was Henr Fitzalyn, 1191-1215. After his deat King John ordered the mayor to b chosen annually. The title 'lord mayo dates from Edward III. 1354. 'Dic Whittington was not thrice but fou times lord mayor, 1397, 1398, 140 1419. Aldermen were first appointed 1242, and a recorder in 1298.

Since middle of 19th cent. London ha greatly increased in all directions, an great number of suburbs have sprun up. First underground railway wa opened in 1863, since when subterranea means of communication have bee greatly extended. Temple Bar wa removed in 1878. Changes in admini tration resulted from the Local Gover ment Acts of 1888, when county London was formed, and 1894, and 1900 the administrative county wa divided into 28 municipal borough Tower Bridge, of which the foundatio stone was laid in 1886, was opened 1894.

During the World War London suffe ed severely from air raids by Ger. ai ships and aeroplanes; bombs fell in a parts of the metropolitan area, but th area between the river and the City an Stoke Newington and Poplar receive most attention from the raiders. To th N. of London, however, considerab damage was also done, particularly in Zeppelin raid in the district of Golder Green, N.W., where one of these gia airships was brought down in flames.

London occupies parts of Middlese Surrey, and Kent, while the outer rin of suburban districts extends also ov parts of Essex and Hertfordshire. Di tricts N. of Thames, next river, from W to E., are Hammersmith, Fulhar Chelsea, Westminster, Strand, Cit and Tower Hamlets; outside thes Kensington, Paddington, Marylebon Hampstead, St. Pancras (from ding streets surrounding the three gre railway stations of St. Pancras f Midland Ry., King's Cross for Gre Northern Ry., and Euston for Lond and N.W. Ry., through Camden Tow and Kentish Town to Highgate), Fin bury, Islington, Hackney, West Ha and between Finsbury and the City a West Ham, partly through Tow Hamlets, the sub-districts of Whi chapel, Stepney, Limehouse, Popl touching the river, and to N. of the Shoreditch, Bethnal Green, Mile-En On S. side, next river, are Wandswort Battersea, Lambeth, Deptford, Gree wich, and Woolwich; outside thes Clapham, Camberwell, Lewisham; acro Lambeth and Southwark are min sub-districts of Brixton, Kenningt

Newington, Bermondsey. Leaving out Strand, Tower Hamlets, West Ham, Whitechapel, Limehouse, Mile-End, Clapham, Brixton, Kennington, and Newington, and adding Holborn (part of Finsbury) and Stoke Newington (N. Hackney), we have list of metropolitan boroughs making up administrative county. Pop. 1921 7,476,168.

City of London within munic. and parl. limits has area of 672 ac.; administrative county, *c.* 117 sq. m.; Greater London, or metropolitan police area, *c.* 692 sq. m. (1921) The Bank of England may be called the central point of the city, and from it streets radiate in all directions. Of these one, as Poultry and Cheapside, leads westward to St. Paul's, whence two great roads lead towards the W.; of these the northern thoroughfare, known successively as Holborn Viaduct, Holborn, Oxford Streets, and Bayswater Road, leads past Marble Arch and northern side of Hyde Park, and so to Hammersmith; while the southern, as Ludgate Hill, Fleet Street (where the Fleet once flowed to join Thames), and Strand (formerly the river bank), leads to Trafalgar Square, and as Pall Mall to Green Park. N.W. of Trafalgar Square is Piccadilly Circus, whence Regent Street curves north-westward to meet Oxford Street at Oxford Circus; while Piccadilly runs westward to Hyde Park Corner, and continues, as Knightsbridge, Kensington Gate, and Kensington High Street, past the S. side of Hyde Park and Kensington Gardens, to the royal borough of Kensington, and W. to Hammersmith. Other important thoroughfares are the Edgeware Road, which represents the Roman Watling Street and leads from Marble Arch towards N.W.; Victoria Embankment, on N. side of river, between Westminster and Blackfriars Bridges; Tottenham Court Road, continuing as Hampstead Road and leading from Oxford Street to N. Hampstead.

Among well-known squares are Belgrave, Eaton, Leicester, Parliament Russell, and Soho Squares; Trafalgar Square and Charing Cross are western business center; and finest shops are in Piccadilly, Regent Street, Oxford Street, Bond Street, and Kensington High Street. There is traffic across Thames by nineteen bridges as well as by steamers and five tunnels. Principal bridges, W. from Tower Bridge, are London Bridge, Blackfriars, Waterloo, Charing Cross, Westminster, Vauxhall, Chelsea, and Battersea Bridges; Waterloo is oldest of existing bridges, constructed in 1811-17.

Among important public buildings are: the Tower of London, covering *c.* 13 ac., which was built by William the Conqueror, was long used as a state prison, now as an arsenal, and has museum with interesting collection of mediæval armor and weapons, and a room in which the crown jewels and regalia are kept; the Houses of Parliament at Westminster, which were built of the sandstone of Aislaby in Whitby, by Barry, are neo-Perpendicular in style; Guildhall, Mansion House, Royal Exchange, and Bank of England, in the City; Somerset House and law courts in the Strand; Brit. Museum, in Bloomsbury, built 1828-52; Victoria and Albert and Natural History Museums, in South Kensington, and the Albert Hall close by; Soane's Museum, in Lincoln's Inn Fields, which contains Wren's plans for rebuilding of London after Great Fire of 1666; the National Gallery and National Portrait Gallery, in Trafalgar Square and St. Martin's Lane. There are also fine art collections at Hertford House, where the Wallace Collection remains, and in the Tate Gallery, Vauxhall; and at Burlington House, in Piccadilly, is held the annual exhibition of the Royal Academy. Royal palaces include Buckingham Palace, originally built in 18th cent.; Westminster Palace, used as royal residence until *c.* 1512; St. James's Palace, which was constructed as such under Henry VIII.; Marlborough House, built by Wren, 1709-10; Kensington Palace, first used as residence by William III., and now open to the public. The Archbishop of Canterbury's palace at Lambeth is mainly modern. There are many beautiful parks, including Hyde Park and Kensington Gardens, between Bayswater Road on N. and Knightsbridge and Kensington on S.; Green Park, bordering on Piccadilly, and St. James's Park, adjoining it; Regent's Park, in Marylebone, which contains Zoological and Botanical Gardens; Battersea Park, in S.W. Hampstead Heath, in the N.W. is a favorite Bank Holiday resort. London's two great cricket grounds are Lord's, seat of the Marylebone Cricket Club, at St. John's Wood, N.W., and the Oval at Kennington, S.E., headquarters of Surrey Country Cricket Club.

London is seat of univ., which has eight faculties, and was organized in its present form in 1900; the government offered a new site, 11½ ac., in Bloomsbury, N. of British Museum extension, for the univ.; in June the Rockefeller Foundation (U.S.) presented $6,000,000 to Univ. Coll. Hospital Medical School and to Univ. Coll. to assist development of medical education and research in London. Public schools include Westminster and St. Paul's. Charitable institutions include the London Hospital in Whitechapel, St. Bartholomew's Hos-

pital in Smithfield, Guy's in Southwark, St. Thomas's in Lambeth, St. George's at Hyde Park Corner, and Queen Charlotte Hospital. There are numerous theatres, about forty of which are situated in the neighborhood of the Strand and Picadilly Circus. Of recent years, the development of the cinema theatre has been so enormous that there are now some hundreds of picture houses in the metropolitan area.

The port of London extends from London Bridge to Queensborough (Sheppey), and is one of the largest and busiest in the world, having 30 per cent. of total trade of U.K.; value of imports is nearly double that of exports, owing to enormous population. London is important distributing center, and is meeting-place of all the great railway systems of the kingdom, and has water communications inland up the Thames valley. Has enormous amount of dock accommodation—London Docks, St. Katharine Dock, East and West India, Royal Victoria, Royal Albert, Millwall, Tilbury, and other docks; warehouses and stores for all kinds of goods, great cold storage buildings, enormous vaults for wines, oils, etc. Center for great bulk of commerce with E. Indies, China, and France. Industries include those connected with food supply, clothing, shipping appliances, house fittings and furnishings, textiles, etc.

LONDON, a city of Ontario, Canada, in Middlesex co., on the R. Thames, includes the suburbs of London Junction and Ealing. There are manufs. of agricultural implements, and breweries, petroleum works, etc. It possesses a university and a ladies' college. Pop. 1921, 53,592.

LONDON, CHARMIAN KITTREDGE (Mrs. Jack London), Author. Born in Los Angeles, California. Educated Mills College, California. Author of: *The Log of the Snark*, 1915; *Our Hawaii Islands and Islanders*, 1917; *The Book of Jack London* (2 volumes), 1921.

LONDON CLAY, in geology, an important member of the Lower Eocene formations of Great Britain, best developed in Thames valley; color, bluish and brownish; numerous fossil remains include fish, reptiles, birds, and plants.

LONDON, JACK (1876-1916), Amer. author. *b.* in San Francisco, *d.* in Glen Ellen, California. From the age of 9 his youth was made up of hard work, varied by brief periods of schooling. He dredged on oyster boats, became owner of one, and made a long voyage on a sealing-schooner in Behring Sea. Through a tramping experience he gained a knowledge of the laboring class and the underworld. He entered University of California, but was forced to leave for lack of funds. In 1897 he was in the gold-rush to the Klondike where he encountered hardships and adventures, that furnished material for many stories. As war correspondent he went to Korea, and later cruised the seas in his own yacht. For some time he lived with his wife in Hawaii. *The Call of the Wild*, 1903, first brought him recognition as an author. Other works are *Son of the Wolf*, 1900; *Daughter of the Snows*, 1902; *The Sea Wolf*, 1904; *Moonface*, 1907; *White Fang*, 1907; *Martin Eden*, 1909; *The Iron Heel*, 1908; *Burning Daylight*, 1910; *Smoke Bellew*, 1912; *Night Born*, 1912; *The Abysmal Brute*, 1913; *Mutiny of the Elsinore*, 1914; autobiographical *Cruise of the Snark*, 1911 and *John Barleycorn*, 1913. See Mrs. London's *The Book of Jack London*, 1922.

LONDON, PACT OF. On April 26, 1915, on the eve of Italy's entrance into the World War, an agreement was signed at London between Great Britain, France, Russia, and Italy, the most important conditions of which were that, under the treaty of peace with the Central Empires, Italy should obtain the Trentino, Cisalpine Tyrol with the Brenner frontier, as well as Trieste, the counties of Gorizia and Gradisca, all Istria as far as the Quarnero and the neighboring islands, the greater part of Dalmatia, and the Bay of Valona. In return, Italy was bound not to oppose the division of N. and S. Albania between Montenegro, Serbia, and Greece. She was also given the sovereignty of the Dodekanese Islands, and was promised a share of the Mediterranean region adjacent to Adalia in the event of the partition of Turkey, as well as the rights and privileges belonging to the sultan in Libya. Great Britain undertook to make a loan to Italy of at least $250,000,000 and Italy was to get a share of any war indemnity exacted from the Central Powers. Finally, it was stipulated that the agreement should be kept secret. Its terms were divulged by the Bolshevik Government of Russia, and were subsequently published by the Brit. Government, April 30, 1920. See FIUME and ITALY.

LONDON, TREATY OF. See BALKAN WARS.

LONDON UNIVERSITY. See LONDON.

LONDONDERRY.—(1) (54° 55′ N., 6° 55′ W.), coast county, Ulster, N. Ireland; area, *c.* 816 sq. miles; surface hilly in center and S., elsewhere flat

drained by Foyle, Bann, Roe; linen manufactures, agricultural produce, fisheries. Formerly belonged to O'Neills Pop. 1911, 140,621. (2) (55° N., 7° 20' W.), town, L. County, Ireland, on Foyle; encircled by walls; R.C. and Anglican cathedrals; episcopal palace on site of former monastery; excellent harbor; salmon-fisheries, shipbuilding yards, linen manufactures, distilleries. Besieged by James II., 1688-89. Pop. 40,800.

LONDONDERRY, ROBERT STEWART, 2ND MARQUESS OF (1769-1822), Brit. statesman; member of Irish Parliament, 1790; Viscount Castlereagh, 1795; Keeper of Privy Seal, Ireland, and Chief Sec., 1797; put down Fitzgerald's conspiracy, and rebellion of 1798; after Union, 1800, M.P. for Down. After duel with Canning, both resigned; Foreign Sec. and leader of House, 1812; for twelve years exercised great power and controlled Lower House; represented United Kingdom at Congress at Vienna, 1814; concluded secret treaty between Britain, Austria, and France against Russ. On Napoleon's final defeat, arranged terms of peace; Home Sec., 1821.

LONG, BRECKINRIDGE (1881), lawyer. *b.* in Missouri. Bachelor of Arts, 1904 Princeton College. 1920 honorary Master of Laws, Washington University. 1906 admitted to Missouri Bar; 1907 began practice in St. Louis; 1917-20 third assistant secretary of state, appointed by President Wilson; 1920 democratic nominee of Missouri for United States Senate, and again in 1922, but defeated.

LONG, CRAWFORD W. (1815-78), an American officer, *b.* in Danielsonville, Ga. He practiced in several cities in Georgia and claimed to have been the first to use ether as an anaesthetic in surgery, in March, 1842. He failed to announce the results at the time and Dr. W. T. G. Morton had in the meantime demonstrated its use in Boston.

LONG, GEORGE (1800-79), an Eng. scholar, was a wrangler at Trinity College, Cambridge, in 1822, and in the following year gained a fellowship, though the future Lord Macaulay was his rival. He served as classical professor at the University of Virginia, 1824-28, and in what was afterwards University College, London, 1828-31. From 1849 to 1871 he held a similar post at Brighton College. Throughout his life he was engaged in editing Greek and Latin texts, and when he was growing old published his laborious *Decline of the Roman Republic*, 1864-74. But the greatest achievement of his industry and learning was the *Penny Encyclopaedia*, 29 vols. 1833-46, of which he was sole editor.

LONG, JOHN DAVIS (1838-1915), an ex-Secretary of the Navy, *b.* in Buckfield, Me. He graduated from Harvard in 1857, began to practice law, served in the Massachusetts legislative assembly, was governor of that state for two terms and a member of Congress from 1883 till 1889. In 1897 President McKinley appointed him Secretary of the Navy, which position he filled during the entire period of the Spanish-American War, and until 1902, when he resigned. He wrote *The New American Navy*, 1903.

LONG, JOHN LUTHER (1861), Author; *b.* in Pennsylvania. Read Law, admitted to bar and practiced at Philadelphia. Author of: *Madam Butterfly*, 1898; *Miss Cherry-Blossom of Tokyo*, *The Fox-Woman*, 1900; *The Prince of Illusion*, 1901; *Naughty Nan*, 1902; *Little Miss Joy-Sing*, 1902; *Sixty Jane*, 1903; *Heimwoh, and Other Stories*, 1905; *Billy Boy*, 1906; *The Way of the Gods*, 1906; *Felice*, 1908; Plays, *Madam Butterfly*, 1900; *The Darling of the Gods*, 1902 (with David Belasco). *Adrea*, 1904; *The Dragon Fly*, 1905 (with E. C. Carpenter). *Dolce*, 1907. (written for Minnie Maddern Fiske). *Kassa*, 1910. (written for Mrs. Leslie Carter). *Baby Grand*, 1912; *War—Or What Happens When One Loves One's Enemy*, 1913; *Lady Betty Martingale*, 1914, (written for Mrs. Fiske). *Billy boy*, 1915 (cantatas). *Yo-Nennen* (with Mr. Leps), 1903; *Gar-Anlaf* (with Mr. Leps) 1905. *The Song of Times*, 1911 (with Dr. Parker), *Operas*, *Andon*, 1904. (with Mr. Leps) *Hosni-San*, 1906 (with Mr. Leps).

LONG, RT. HON. WALTER HUME (1854), Brit. politician; entered Parliament as Conservative member for N. Wilts, 1880, and has since represented successively Devizes, W. Derby (Liverpool), S. Bristol, S. Dublin, the Strand div., and St. George's, Westminster; was parl. secretary to Local Government Board, 1886-92; president of Board of Agriculture, 1895-1900; president of Local Government Board, 1900-5 and 1915-16; chief secretary for Ireland 1905-6; secretary of state for the colonies 1916-18; first lord of the Admiralty, 1919.

LONG, WILLIAM J. (1867), an American clergyman and naturalist, *b.* in North Attleboro, Mass. He was ordained to the Congregational ministry in 1889. He lectured much on nature

subjects and wrote many books on natural history. It was in connection with the criticism of his work by Theodore Roosevelt that the epithet 'nature faker' came first into use.

LONG BEACH, a city of California, in Los Angeles co It is on the Pacific Ocean, 20 miles S. of Los Angeles. It is a favorite resort and has also large industrial interests. Pop. 40,000.

LONG BRANCH, a city of New Jersey in Monmouth co. It is on the Pennsylvania and the New Jersey Central railroads, and on the Shrewsbury River and Atlantic Ocean. It is one of the oldest and most famous summer resorts in the United States and has a beach especially suitable for bathing. Its advantages as a summer resort were recognized as early as 1790 and it was much visited by people from New York and Philadelphia. Its popularity has continued. The city has many hotels, pleasure resorts, cottages, parks and a boardwalk and driveways. It is connected by electric railroad with other coast resorts. Its public buildings include a library, schools, a national bank and a hospital. Pop. 1920, 13,521.

LONGCHAMP, WILLIAM (*d.* 1197), Eng. chancellor and bp. of Ely under Richard I.; opposed John; banished, 1191; undertook diplomatic missions for Richard.

LONG EATON (52° 55′ N., 1° 17′ W.), town, Derbyshire, England; lace. Pop. 20,000.

LONGEVITY, scientifically, refers to the length of life of any organism. In the case of lower forms of life very little has been determined, but the range is probably large; L. of a few hours is common. Higher plants are classed as annuals, biennials, perennials, etc., the range extending from a month to thousands of years.

LONGFELLOW, HENRY WADSWORTH (1807-82), Amer. poet; *b.* Portland, Maine; educated at Bowdoin Coll., Brunswick; became prof. of modern languages at Bowdoin, 1829, after three years' traveling in Europe; prof. of modern languages at Harvard, 1835; was married twice—in 1831 to Mary Storer Potter, who died in 1835, and in 1843 to Frances Elizabeth Appleton. He traveled to Europe several times, and was particularly popular in England. After his death a bust was placed in the 'Poets' Corner' of Westminster Abbey.

His earlier poems, before he became saturated with European mediævalism and mysticism, are natural and fresh. All through his works the religious el ment bulks large, but deep psycholog is lacking.

Chief works: *Voices of the Night,* book of original poems, 1839; *T Spanish Student,* a drama, 1843; *T Poets and Poesy of Europe,* a collectio containing many of his translation 1845; *Evangeline,* 1847; *The Gold Legend,* 1851; *Tales of a Wayside In* 1863-74; translation of Dante's *Divi Commedia,* 1871.

LONGFELLOW, SAMUEL (1819-9 Unitarian minister and hymn writ *b.* Portland, Maine; *d.* Cape Elizabet Maine. He was a brother of Henr Wadsworth Longfellow, the poet, whom he wrote a biography. H graduated from Harvard Divinity Scho in 1846, and between 1848 and 18 held pastorates at Fall River, Mass Brooklyn, N.Y., and Germantown, P He attained a moderate fame as a writ of hymns, of which he wrote man among them *The Church Universal* an *The Christian Life,* and published sever volumes of compilations.

LONGFORD.—(1) (53° 40′ N., 52′ W.), county, Leinster, Irelan area, *c.* 421 sq. miles; surface general flat; produces potatoes, oats; livesto raised; manufactures linen. Pop. 45,00 (2) (53° 44′ N., 7° 43′ W.), county tow of above; R.C. cathedral. Pop. 4,00

LONGINUS, CASSIUS (*c.* 213- A.D.), Gk. rhetorician and philosophe taught for many years at Athens, whe he had Porphyry for a pupil. Later became adviser of Zenobia at Palmyr whom he encouraged to resist Aurelia the latter, when victorious, put him death. Of his writings little has survive The treatise, *On the Sublime,* former ascribed to him, probably belongs the I. cent. A.D.

LONG ISLAND, an island whi forms part of the State of New Yor Its extreme length is 118 miles and width varies from 15 to 23 miles. total area is 1,682 square miles. It connected with Manhattan by fo bridges and three tunnels. The isla is divided into four counties, King Queens, Nassau and Suffolk. That po tion comprising Kings and Quee counties forms part of the city New York, under the names of the Bo ough of Brooklyn and Borough Queens.

LONG ISLAND CITY, a form municipality of Queens co., Long Islan Since January 1, 1898 it has been a pa of the Borough of Queens of Great New York. It previously compris the towns of Hunterspoint, Ravenswoo

Bissville, Dutch Kills, Steinway and Astoria. It is separated from Brooklyn by Newtown creek and is connected with the Borough of Manhattan by bridges, tunnels and ferries. It has grown in recent years to be one of the most important manufacturing towns in New York City. Its nearness to Manhattan and the increased transportation facilities have added greatly to its growth and development. There are several hospitals, banks, and libraries.

LONG ISLAND SOUND, an arm of the Atlantic separating Lond Island in New York State from the mainland. It extends northeast and southwest and is 110 miles long and 10 to 25 wide. On the east it is connected with the Atlantic by a narrow channel, the Race, south of Fisher's Island, on the W. by the East River which enters New York Bay. New Haven harbor and Pelham Bay are the largest indentations on the north side; Northport, Oyster, Manhasset, Little Neck, and Flushing Bays are on the south shore. In the western part there are a number of small islands, some inhabited, the principal ones being Glen Island and City Island. At the entrance of the East River there are islands used chiefly by the Health Department of New York City. Fisher's Island is the largest of a group that extends diagonally from Long Island to the State of Rhode Island. The principal rivers emptying into the Sound are the Connecticut, Mystic, Thames, and Housatonic.

LONGITUDE. See LATITUDE AND LONGITUDE.

LONGLEY, HARRY SHERMAN (1868), bishop. *b.* in Cohoes, New York; graduated in 1891, St. Stephen's College; 1912 Doctor of Divinity. Graduated 1894, General Theological Seminary; 1894-95 curate St. Paul's Parish, Troy, New York, 1895-99 rector Trinity Church, Milford, Massachusetts; 1899-1911, Christ Church, Binghamton, New York; 1911-12 St. Mark's Parish, Evanston, Illinois; 1912 consecrated suffragan bishop of Iowa; 1917 elected coadjutor bishop of Iowa; 1920 presiding bishop of Province of Northwest. 1907 deputy General Convention, Protestant Episcopal Church, Virginia, 1912 Cincinnati. Trustee Seabury Divinity School.

LONGOBARDI. See LOMBARDS.

LONG PARLIAMENT (1640-60), see ENGLAND (*History*); CROMWELL, OLIVER.

LONGSTREET, JAMES (1821-1904), a Confederate soldier, *b.* in Edgefield District, S.C. He graduated from West Point Military Academy, in 1842, served through the Mexican War and was a major-general in the U.S. Army when the Civil War broke out. He then resigned, joined the Confederate Army as brigadier-general, and as such was in command of troops at both battles of Bull Run, had command of the Confederate right wing at Antietam and of the left wing at Fredericksburg. At the Battle of Gettysburg his command bore the brunt of the heaviest fighting. At Chickamauga he saved the day for the Confederates by a timely arrival. Toward the close of the war he was under Lee. In 1880 he was sent as U.S. Minister to Turkey and in 1897 he was appointed U.S. Commissioner of Pacific Railroads. He wrote *From Manassas to Appomattox*, 1896.

LONGTON (52° 59′ N., 2° 8′ W.), town, Staffordshire, England; pottery. Pop. 38,000.

LONGUEVAL, village, Somme, France (50° 2′ N., 2° 44′ E.), 6 m. S. by W. of Bapaume; a strong point in the Ger. second line of defense during the first battle of the Somme; taken by British, July 14, 1916; finally cleared, July 28; recovered by Germans in offensive of March-April, 1918; finally regained, Aug. 26, 1918.

LONGUEVILLE, ANNE GENEVIEVE, DUCHESSE DE (1619-79), *dau.* of Henri, Prince of Condé; *m.* Duc de Longueville, 1642; played important part in Fronde wars; subsequently embraced Jansenist opinions; renowned for piety.

LONG VIEW, a city of Texas, in Gregg co., of which it is the county seat. Its industries include saw and planing mills, power works, bottling works, etc. Pop. 1920, 5,700.

LONGWORTH, NICHOLAS (1783-1863), horticulturist; *b.* Newark, N.J. As a young man he engaged in law, banking and business pursuits in Cincinnati, and eventually discarded all professional interests in order to establish grape cultivation for wine production in the Ohio Valley. He succeeded after several failures in growing the vine and was referred to as the 'Father of American Grape Culture.' He attained note also as a national authority on horticulture.

LONGWORTH, NICHOLAS (1869), an American public official, *b.* in Cincinnati. He graduated from Harvard University in 1891 and three years later was admitted to the bar. He took an active part in politics and was elected to the House of Representatives in 1903 and re-elected successively. On Feb-

ruary 17, 1906 he married Alice Lee Roosevelt, daughter of Theodore Roosevelt. He was recognized as one of the most conspicuous members in the House of Representatives.

LONGWY (47° 32′ N., 5° 45′ E.), town, Meurthe-et-Moselle, France; fortified; ironworks. The neighborhood was the scene of severe fighting during the first year of the World War. Pop. 10,000.

LOO, card game; three cards dealt; trumps determined by turning up first card after dealing. An extra hand, 'missy,' or 'widow,' is dealt; may be exchanged for dealt hand.

LOO-CHOO, LU-CHU, LIU-KIU, a group of islands which belong to the empire of Japan, and extend S.W. from the island of Kiushiu, towards Formosa their area being about 1870 sq. m. The chief islands of the group are Oshima, Tokunoshima, Ishigaki, Iriomote, and Oniwaka, the last one being the most important, and having Shuri, the capital, situated on it, with Nafa as its port. Some of the islands are of volcanic formation, while others are coral islands. They have a pleasant warm climate, but are subject to typhoons. The soil of the islands is fertile, and produces large quantities of sugar as well as sweet potatoes—the chief food of the inhabitants—rice, sago, tea, tobacco, fruit, and oranges with an aromatic flavor. During the 14th century the kingdom of Loo-Choo paid tribute to China, but also had connections with Japan. In 1609 it was subject to Satsuma, but in 1874 the claims of China were given up, and a year or two later Loo-Choo became a part of the empire of Japan.

LOOKOUT MOUNTAIN, a ridge running north-northwest and south-southwest, from near Chattanooga, Tenn., across the northwest corner of Georgia and extending into Alabama. Its highest point is 2,126 feet about 2½ miles from Chattanooga. In this vicinity the great Battle of Chattanooga (*q.v.*) was fought in the Civil War.

LOOM. See WEAVING.

LOOMIS, CHARLES BATTELL (1861-1911), an American author, born at Brooklyn, N.Y. Among his works are: *The Four-masted Catboat,* 1899; *Cheerful Americans,* 1903; *I've been Thinking,* 1905; *A Bath in an English Tub,* 1907; *A Holiday Touch,* 1908; *Little Maude and Her Mama,* 1909.

LOOMIS, ELIAS (1811-89), an Amer. scientist, *b.* at Willington, Connecticut, and graduated at Yale, 1830. He was tutor in the same college, 1833-36; appointed professor of mathematics i the Western Reserve College, Ohi 1837; held the professorship of natura philosophy and mathematics in Ne York University, 1844-60; and in 186 became professor of natural philosoph and astronomy at Yale. He publishe several series of text-books on mathe matics, philosophy, astronomy an meteorology.

LOÓN (9° 50′ N., 123° 50′ E.), town Bohol, Philippine Islands. Pop. 19,000.

LOOS, a town in northern France which is notable for being the scene o one of the most fiercely fought battle of the World War. Although many othe engagements took place there, the battl of Loos as it is generally known bega September 25, 1915. It was fough between the British and the Germa armies and was the greatest engagemen in which the British had taken part u to that time. The fighting continued with brief intervals, for three weeks an 12 British divisions were used. Whil the British gained in the battle ove 7,000 yards of front and captured 3,00 prisoners, they lost 50,000 men an 2,000 officers. The result of the grea battle was on the whole indecisive See WORLD WAR.

LOPE, FELIX DE VEGA CARPI (1562-1625), a Spanish poet and drama tist, *b.* in Madrid. He took part i the expedition to the Azores in 1582, an also served in the Invincible Armada i 1588. He was secretary to the Duke o Alva and the Marquis of Malpica, an in 1613 took holy orders. He was hel in high estimation in his own day, an his influence in Spain was as great a that of Voltaire in France. He was voluminous writer, and epics, pastoral odes, sonnets, and novels all fell from h pen, but it is, however, to his dramat works that he owes his eminent plac in literary history, and of these he wro altogether over 2000. Some of his be known are: *Los Ramilletes de Madri La Boba para los Otros y Discreta pa si*; *El Perro del Hortelano*; *La Viud de Valencia*; *El Maestro de Danzar*; *L Flores de Don Juan*; *Desprecio agrad cido*; *Estrella de Sevilla*; *Esclava de Galan*; *Premio del bien Nablar*; *Alcal de Talamca.* Among his other works a the *Angelica,* an epic poem, written i imitation of the *Orlando Furioso*; th *Arcadia,* a pastoral romance; *Dragonte* a poem concerned with the history an death of Drake; *Isidro,* a sacred poe which deals with the life of Isidor patron saint of Madrid; *Peregrino e su Patria,* a romance; *Jerusalem Co quistada,* an epic in competition wit Tasso; *Pastores de Belen,* a religiou

pastoral; *La Filomena*, *La Circe*, written in emulation of Cervantes; *Laurel de Apolo*, and *La Dorotea*, a prose drama.

LOPEZ, CARLOS ANTONIO (1790-1862), Paraguayan despot; *b.* Asuncion. During the dictatorship of Francia he was obliged to live in concealment, but after his death he developed the resources of the country and expanded its powers.

LOPEZ, FRANCISCO SOLANO (1827-1870), a president of Paraguay, *s.* of Don Carlos Lopez. After serving in the army he filled various diplomatic positions in Europe. In 1855 he became minister of war, and in 1862 succeeded his father as president. He was very ambitious and in 1864 undertook to invade Brazil. Argentina and Uruguay allied themselves with Brazil and Lopez, after a conflict which lasted five years, was finally defeated and killed on March 1, 1870.

LOQUAT, a free tree found in China and Japan, of the natural order Rosaceae. It has been introduced with success in Australia, Florida and California, where it grows abundantly. The tree attains a height of 20 to 30 feet. It is a beautiful evergreen, with white flowers. The fruit is about the size of a large gooseberry and is of an agreeable taste. The seeds also are edible. Luther Burbank conducted a series of interesting experiments which resulted in an improved fruit of this tree.

LORAIN, a city of Ohio, in Lorain co. It is on the Lake Erie, Northern Chicago, Baltimore and Ohio, Lorain and West Virginia, and Lake Shore Electric railroads. It is the center of an industrial community and is one of the most important steel manufacturing cities of the country. It is well supplied with natural gas and is the center for the central Ohio coal fields. It has a Carnegie library, a hospital, and other public buildings. Pop. 1920, 37,295.

LORALAI (30° 22′ N., 68° 35′ W.) town and district, Baluchistan, India. Pop. of district, 70,000, town, 4,000.

LORCA (37° 44′ N., 1° 43′ W.), town, E. Spain; wine, lead, textiles; scene of hostilities during wars with Moors. Pop. 1919, 70,807.

LORCH.—(1) (50° 2′ N., 7° 47′ E.), town, Hesse-Nassau, Germany; wine. Pop. 2,500. (2) (48° 47′ N., 9° 42′ E.), Württemburg, Germany; cement. Pop. 3,100.

LORD, a title in feudal times of a grantor or proprietor of land. In a general way, all those who are noble by birth or creation and members of the peerage may be called Lords. It is also the title given in England to judges and bishops.

LORD CHIEF JUSTICE, in England president of the High Court (appointed by the crown) in absence of the lord chancellor; ex-officio judge of Court of Appeal; presides over King's Bench Division. Salary, $40,000.

LORD, HERBERT MAYHEW (1859) Army Officer, *b.* in Rockland, Maine. Graduated at Colby College in 1884. Served as clerk in House of Representatives and Senate, Washington, and did newspaper work until 1898. Appointed major additional paymaster volunteers, 1898. 1901 honorably discharged. Captain paymaster United States Army, 1901; Major paymaster, 1902; lieutenant colonel Quarter Masters Corps, 1913; Colonel 1917; brigadier-general, National Army, 1918; brigadier-general, United States Army, 1919. 1918 appointed assistant to Major-General Goethals, title director of finance. In 1922 he succeeded C. G. Dawes as Director of the Budget. During World War served as Liberty Loan Officer. Awarded Distinguished Service Medal.

LORD HIGH CHANCELLOR, speaker or prolocutor of House of Lords; not necessarily a peer, but, by established custom, on attainment of office he is raised to peerage. The Lord Chancellor is custodian of the Great Seal, and Presiding Lord of Appeal in cases before House of Lords; highest judicial officer in kingdom; appoints all County Court judges and J.P.'s; must be a member of Established Church.

LORD HOWE ISLANDS (31° 30′ S.; 159° E.), Brit. group of islands, S. Pacific; 450 miles N.E. of Sydney; administered by New South Wales.

LORD OF THE ISLES, title of chiefs of Scot. Western Isles; Somerled received a grant of Bute and Arran from David I., 1135; a descendant, after Haco of Norway's defeat, ceded Western Isles to Scotland, and henceforth Lords of the Isles were vassals. Notable Lords were Donald, *d. c.* 1420, who sought England to help to make Isles independent; John, *d. c.* 1498, last Lord, had his lands confiscated, but retained title.

LORD'S PRAYER. See RELIGION.

LORD'S SUPPER. See EUCHARIST.

LOREBURN, SIR ROBERT THRESHIE REID, EARL (1846), Brit. jurist and politician; was called to the bar 1871, and became Q.C. twelve years later; became Liberal M.P. for Hereford

1880, subsequently representing his native county, Dumfries, from 1885 till 1905. He was appointed solicitor-general, 1894, and later in the year became attorney-general. He was lord-chancellor, 1905-12, and was created a baron, 1906 and an earl, 1911. Author of *Capture at Sea*, 1913; and *How the War Came*, 1919.

LOREE, LEONOR FRESNEL (1858), an American railroad president, *b.* in Fulton City, Ill. He graduated from Rutgers College in 1877 and immediately entered the service of the Pennsylvania R.R. as a member of its engineering staff. He rose through the various grades until he became a divisional general manager. From 1901 to 1904 he was president of the Baltimore & Ohio R.R. Co., since 1907 he has been president of the Delaware & Hudson R.R. Co. and president or director of 34 other companies affiliated or otherwise connected with it, and a director of a great number of other corporations outside of the railroad industry.

LORELEI, LURLEI (50° 8′ N., 7° 45′ E.), rock, some 430 ft. high, on right bank of Rhine, a few miles below Bingen; legendary haunt of a siren. *Die L.* is a celebrated poem by Heine.

LORENZ, ADOLF (1854), Austrian orthopedic surgeon. He graduated from the University of Vienna in 1880 and later became professor of surgery there. Specializing in orthopedic surgery, he developed an operation in hip-joint diseases that made him famous. It was a 'bloodless' method of reducing congenital dislocation, and consisted first in stretching and parting the muscles instead of cutting them, and then by manipulation alone. After the operation the patient wore a plaster cast for several months. His method was generally recognized as effective by the German medical profession. In 1902 he demonstrated the operation in the United States, arousing great interest, and in 1921 paid another visit to treat poor disabled children out of gratitude for American aid given to starving Vienna following the World War. He remained several months in New York City, treating many cases, and received a New York State license to practice medicine. His methods were challenged by American orthopedic surgeons, who opposed his holding clinics. On the other hand he was received at City Hall and thanked by the mayor for his services to crippled children. He invented several instruments and developed other orthopedic operations, including a method of remedying clubfoot.

LORETO (3° 49′ S., 70° 9′ W.), department, N.E. Peru; a vast plain thickly wooded; traversed by the Ucayali and Huallaga; chief export, rubber; capital, Iquitos. Pop. *c.* 110,000.

LORETO, LORETTO (43° 27′ N., 13° 35′ E.), town, Ancona, Italy, on Musone. Its Santa Casa, reputed to have been the house of the Virgin Mary in Nazareth, has long been a famous pilgrimage shrine; rosaries, crucifixes manufactured.

LORIENT (47° 47′ N., 3° 21′ W.), fortified seaport and naval arsenal, Morbihan, France, at confluence of Scorff and Blavet; extensive docks and shipbuilding yards; iron-founding, engineering, and fishing industries; founded by Fr. East India Co., 1664; Brit. naval victory over French off L., June 1795. It is one of the five naval arrondissements of France. Pop. 50,000.

LORIMER, GEORGE HORACE (1868), American editor and author. Educated at Colby and Yale (Litt. D.). Editor of The Saturday Evening Post since 1899. Author: *Letters of a Self-made Man to his Son*, 1902; *Old Gorgon Graham*, 1904; *The False Gods*, 1906, and *Jack Spurlock—Prodigal*, 1908. Chevalier of the Legion of Honor.

LORING, WILLIAM WING (1818-86), a Confederate soldier, *b.* in Wilmington, N.C. He enlisted in the U.S. Army as a private, served through the Florida War, rose from the ranks and for many years led campaigns against the Indians. In the Civil War he served in the Confederate Army with distinction, was for a time in the banking business in New York and from 1869 to 1879 was on the general staff of the Khedive of Egypt, whose army he reorganized very effectively. After his return he wrote *A Confederate Soldier in Egypt*, 1884.

LORIS or **SLOW LEMURS** (*Nycticebus* and *Loris*), two genera of Lemuroidea (*q.v.* under PRIMATES); with short tail or none, index finger small and nailless, bases of toes webbed; nocturnal, vegetarian and carnivorous; found in tropical Asia.

LORIS-MELIKOFF, MIKHAIL TARIELOVITCH, COUNT (1825-88), Russian general and statesman, born at Tiflis, and entered the army in 1845. He commanded a regiment during the Crimean War, and on the capitulation of Kars was made governor of the stronghold. Afterwards he conducted a brilliant campaign in the war against Turkey, and was made governor-general of Kharkov in 1879. Subsequently he became Minister of the Interior under Alexander II., and introduced many

reforms in the Russian administration.

LORNE, JOHN GEORGE DOUGLAS, MARQUIS OF, and Duke of Argyle (1854), a Scotch nobleman. He was educated at Eton and Cambridge. In 1871 he married Princess Louise, daughter of Queen Victoria. From 1878 to 1883 he was governor-general of Canada. He wrote several books of travel and verse.

LORRAINE. See under ALSACE-LORRAINE.

LOS ANDES (8° 40′ N., 71° W.), former state of Venezuela, now included in states Tachira, Trujillo, and Mérida.

LOS ANGELES, a city of California, in Los Angeles co., of which it is the county seat. It is on the Southern Pacific, the Atchison, Topeka and Santa Fe, the San Pedro, Los Angeles and Salt Lake, and the Pacific Electric railroads, and on the Los Angeles river. It has a total area of about 300 sq. miles. The city is noted for its climate and for the beauty of its surroundings. It has developed from a summer resort into a large industrial and commercial city. It has an excellent harbor and a system of docks which were constructed at a cost of over ten million dollars. The city is the center of an important fruit growing region and exports vast quantities of oranges, lemons, livestock and oils. It is also the center of the mining-region of southern California and Arizona. It has also large petroleum refineries, foundries and machine shops, meat packing plants, publishing houses, etc. The city is the seat of the State Normal School, University of Southern California, Occidental College and St. Vincent's College. The public buildings include the city hall, court-house, Hall of Records, auditorium, Blanchard Art building, and a Roman Catholic cathedral. The city has a fine system of parks which cover nearly 5,000 acres. A notable development in recent years has been in relation to the moving picture industry. The clear atmosphere and varied scenery in the neighborhood have combined to make it an ideal locality for the taking of moving pictures. Huge studios are maintained by many of the largest moving picture companies. These are chiefly in the suburb known as Hollywood. The city has had a large increase in population from 1910. By the census of 1920 it was the largest city of California, exceeding San Francisco in population. The population grew from 319,198 in 1910 to 575,480 in 1920.

Los Angeles was settled in 1781 by Spaniards. In 1864 it was captured by Commodore Stockton. It received its city charter in 1851.

LOS ISLANDS (9° 20′ N., 13° 40′ W.), group of volcanic islands, off coast of Fr. Guinea, W. Africa.

LOSSING, BENSON JOHN (1813-91), historian and engraver; *b.* Beekman, N.Y.; *d.* Dover Plains, N.J. After publishing a newspaper in Poughkeepsie, he founded an engraving and printing business in New York City, and in 1850-1 published his *Pictorial Field Book of the Revolution* issued in installments and illustrated by more than 1,000 of his own engravings, which entailed his visiting and making actual sketches of every important Revolutionary scene and battlefield. He published many other pictorial works of a popular character and several volumes of American history.

LOT, in *Genesis*, traditional progenitor of Ammon and Moab.

LOT (44° 40′ N., 1° 40′ E.), department, S.W. France, formed chiefly from ancient province Quercy, in Guienne; hilly; chief rivers, Lot and Dordogne; principal products, wine, tobacco, cereals; capital, Cahors. Pop. 210,000.

LOT (44° 30′ N., 1° 4′ E.), river, S. France, joins Garonne near Aiguillon; length, 360 miles; 194 miles navigable; ancient *Oltis*.

LOT-ET-GARONNE (44° 20′ N., 0° 30′ E.), department, France, formed from part old provinces of Guienne and Gascony; watered by Garonne and affluents; chief occupation, agriculture; capital, Agen. Pop. 270,000.

LOTHAIR (825-69), king of Lorraine (Lotharingia); chiefly remarkable for attempts to divorce wife, Teutberga; supported by Louis the German.

LOTHAIR (795-855), Holy Rom. emperor; succ., 840; defeated by bro's at *Fontenoy*, 841; by Treaty of Verdun obtained imperial title and Italy.

LOTHAIR II. or **III.** (*c.* 1070-1137), Holy Rom. emperor; duke of Saxony, 1104; elected Ger. king, 1125; defeated Conrad of Hohenstaufen, his rival for imperial crown, 1129; captured Nuremberg and Spires; supported Innocent II. against Anacletus II., rival pope; reduced Bavaria to order; defeated Hohenstaufen; extended imperial power over S. Italy.

LOTHIAN, the three counties of Haddington, Edinburgh, and Linlithgow, in Scotland, are called the L's. For some cent's the whole district from Tweed to Forth was called L., and formed part of Anglian kingdom of Northumberland; but in 1018 it was taken by the Scots.

way for Fr. Revolution.

LOUIS XVI. (1754-93), king of France; grandson of Louis XV.; succ., 1765; encouraged Turgot's reforms; later influenced by wife, Marie Antoinette (*q.v.*); Fr. Revolution of 1789 precipitated by extravagance of court and ministry; imprisoned by revolutionaries; deposed and executed, Jan. 21; well-intentioned, but weak, he reaped what others had sown.

LOUIS XVII. (1785-95?), titular king of France; *s.* of Louis XVI. and Marie Antoinette; never reigned; imprisoned in Temple, 1792; recognized as L. XVI.'s successor by Royalist party, 1793; formation of plots began for his release; under guardianship of cobbler named Simon and his wife, who left Temple, 1794; was subsequently kept in dark room like cage; said to have died, 1795. Ere long it was rumored he had escaped; whether he died or escaped is still conjectural, probability seeming to point to latter alternative. At Restoration many pretenders, notably Naumdorff, appeared in his name.

LOUIS XVIII. (1755-1824), king of France; younger bro. of Louis XVI.; fled from France during Revolution, 1791; established headquarters at Coblenz, became leader of anti-revolutionary party; declared himself regent, 1793, king, 1795; life marked by travels and plots; served with Condé, 1796; subsequently lived at Blanckenberg, Mittau, Warsaw and in England; refused to abdicate in Napoleon's favor. After latter's defeat, 1814, Bourbons were restored to throne of France, and L. returned to Paris as king; promised to grant constitution; fled on Napoleon's return; again restored, 1815; soon dismissed Talleyrand and Fouché; confided affairs to Decazes and Richelieu.

LOUIS I. (1326-82), king of Hungary and Poland; succ. to Hungarian throne, 1342; waged three wars against Venice, 1346, 1357-58, 1378-81; defeated in first, successful in others; succ. uncle as king of Poland, 1370; defeated Turks, 1372.

LOUIS II. (1506-26), king of Hungary and Bohemia, 1511; drowned after defeat at Mohács.

LOUIS I. (1339-84).—Louis II. (1377-1417).—Louis III. (1403-34), Dukes of Anjou; titular kings of Naples.

LOUIS D'OR, a gold coin of France, first struck in the reign of Louis XIII. It was valued at about $4 and continued to be coined until 1795.

LOUIS, LUDWIG, Ger. kings of East Franks. Louis the German (804-76), succ. to kingdom of Bavaria, 817; after defeat of Lothair at *Fontenoy*, 841 received Carolingian territories east o Rhine; suppressed Saxon rising, 842 subdued Abotrites; failed to acquir Acquitaine; supported Lothair of Lor raine.—Louis the Younger (*d.* 882) succ., 876.—Louis the Child (893-911) succ., 899; last of Carolingian line f Germany; reckoned by some as Emperc Louis IV.

LOUIS OF NASSAU, LUDWIG (1538 74), *s.* of Count of Nassau; raised troop in aid of Dutch revolt against Spain defeated Spaniards at *Heiligerlee*, 1568 defeated at *Jemmingen*, 1568; killed a *Mookerheide*.

LOUIS PHILIPPE I. (1773-1850) king of the French; *s.* of Philipp 'Egalité'; cousin of Louis XVI.; fough as Duc de Chartres in revolutionar army; left France, 1793; returned 1814; became associated with Libera party; lieut.-gen., 1830. On depositio of Charles X., L.P. was proclaimed 'kin of the French,' 1830; crushed insurrec tions in Lyons and Paris, 1834; put dow Louis Napoleon's rising at Boulogn 1840; strengthened *entente* with England 1843; subsequently broke it by trans actions concerning the 'Span. marriages seeking to re-establish his family influence in Spain. Extension of fran chise was demanded by people, 184 followed by revolution, 1848, when L.P had to abdicate and flee to England.

LOUISBURG (45° 56′ N., 60° W. town and ruined fortress, Cape Breto Nova Scotia, Canada; formerly im portant seaport.

LOUISE OF SAVOY (1476-1531 mother of Francis I.; ruled France fro his accession, 1515, till her death greedy, passionate, corrupt; exercise fatal influence on France.

LOUISIADE ARCHIPELAGO (1 S., 152° 30′ E.), archipelago of sma islands, Pacific Ocean, belonging t Britain.

LOUISIANA (29° to 33° N.; 89° to 94′ W.), one of southern states of U.S bounded N. by Arkansas, E. by Missi sippi and Gulf of Mexico, S. by Gulf Mexico, W. by Texas; area, 48,720 s miles. Surface flat and marshy, especia ly towards the sea; L. has coast-line over 1200 miles along Gulf of Mexic and is drained by Mississippi, Red R and Sabine; capital, Baton Roug largest towns, New Orleans, Shreveport

L. is said to have been visited by Ferd nand de Soto in 1541; partially explore in 1682 by de la Salle, who annexed to France and named it after Louis XIV acquired in 1717 by John Law's Missi

sippi Co., which eventually came to grief, and in 1731 was again in hands of Crown; ceded to Spain in 1762, but restored to France in 1800. Three years later L. was acquired from Napoleon by U.S. by *Louisiana Purchase* (*q.v.*); admitted as state of Union, 1812; took part in war against British in 1812-15, during which the battle of *New Orleans*, 1815, resulted in Brit. defeat; seceded from Union in 1861; during Civil War great number of engagements took place within its bounds, and New Orleans was in 1862 taken by Federals. After close of war L. was restored to Union, 1865; in 1868 franchise was extended to blacks, and for some time the state suffered from political disturbances, which in 1873 amounted to civil war.

Executive power is vested in gov., who is assisted by various officers of state and holds office four years; legislative authority vested in Senate of 41 members and House of Representatives of 115 members, both elected for four years by popular vote. Supremacy of white population in political matters is secured by clauses requiring voter either to have certain property qualification, to be able to read and write, or to prove that his father or grandfather had vote on Jan. 1, 1867. State sends two Senators and eight Representatives to Federal Congress.

L. is thickly wooded in parts, producing yellow pine, cypress, cotton-wood, oak, etc.; a great cotton, sugar-cane, and rice-producing region, these being grown in large quantities along coast and Mississippi valley; also produces corn, oats, potatoes, tobacco, fruits. Horses, cattle, sheep and pigs are raised, and there are important fisheries. Industries include lumbering, sugar-refining, preparation of rice, manufactures of machinery, cotton-seed oil, tobacco, beer, confectionery. Minerals include rock-salt, sulphur, petroleum. Railway mileage about 5,700. See MAP U. S.

Denominations in order of numerical importance are Roman Catholic, Baptist, Methodist, Episcopalian, Presbyterian. Education is free and is greatly improving; there is a univ. at Baton Rouge, and New Orleans is seat of Tulane Univ. and also of a univ. for negroes, and several colleges. Pop. 1920, 1,797,798.

LOUISIANA PURCHASE. On April 30, 1803 the United States bought the province of Louisiana from France. It had been ceded by France to Spain in 1762 and re-ceded to France in 1800. Napoleon was at war with England and could not hold the province. The price paid was 80,000,000 francs, the United States agreeing also to pay 20,000,000 francs of debts. The treaty ratified by the senate provided that the inhabitants, about 90,000, should be incorporated in the United States with all the rights and privileges of citizens. Special privileges at New Orleans were offered to the ships of France and Spain for 12 years.

LOUISIANA PURCHASE EXPOSITION. Held at St. Louis, April 30 to December 1, 1904 to celebrate the centenary of the purchase of Louisiana from France. The exposition was organized May 2, 1901 with David R. Francis as president. Legislative authority was obtained for raising the capital, $25,000,000, of which the United States contributed one fifth. The site chosen was within the city limits including 1200 acres of Forest Park. In the grounds were about 2500 groups and 1000 figures in sculpture. Admissions 19,694,855 of which 12,804,616 paid. Total expenses $31,586,331. Total receipts $11,952,254.

LOUISIANA STATE UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE, the head of the public school system of Louisiana, in Baton Rouge. It was first established in Alexandria, as the Louisiana State Seminary, but was removed to Baton Rouge in 1869, and in 1877 merged with the Louisiana Agricultural and Mechanical College, organized in New Orleans three years previously. It has departments of arts and sciences, agriculture, engineering, law and a normal school.

LOUISVILLE, a city of Kentucky, in Jefferson co., of which it is the county seat. It is on the Louisville and Nashville, the Louisville, Henderson and St. Louis, the Cleveland, Cincinnati, Chicago and St. Louis, the Illinois Central, the Chesapeake and Ohio, the Southern, and other railroads, and on the Ohio River. It is built at the falls of the river, 400 miles from its mouth, and is sometimes known as Falls City. It has a total area of 14,348 acres. Louisville is the chief commercial and industrial city of the State. Its industries, which are varied, comprise over 250 plants. The manufactures include woodworking, metal working, textiles, varnish, paint, oil, refrigerating machinery, and clothing factories. Prior to the enactment of the prohibition amendment Louisville was one of the chief cities in the distilling of liquor. The public buildings are many and modern. They include a court-house, city hall, free public library, U.S. Government building, Masonic Temple, Commerce Building, and many semi-public and public institutions. There is also a magnificent city hospital. In the public schools are

enrolled nearly 40,000 children. The institutions of higher education include the University of Louisville, Jefferson School of Law, and several theological seminaries. There are also several important institutions for the education of colored people.

Louisville was first settled by 13 families under Colonel George Rogers Clarke, in 1778. The city was incorporated two years afterwards and named Louisville in honor of Louis XVI. of France, whose soldiers were at that time aiding the Americans in the Revolutionary War. It suffered greatly by Indian attacks. In 1890 it was visited by a cyclone which killed over 100 persons and destroyed property valued at over $3,000,000. Pop. 1920, 234,891.

LOULÉ (37° 4′ N., 7° 54′ W.), town, Faro, Portugal; basket-making; leather manufactures. Pop. 23,000.

LOUNSBURY, THOMAS RAYNESFORD (1838-1915), college professor and critic; *b.* Ovid, N. Y. He graduated from Yale in 1859, fought in the Civil War, practiced as a tutor, and from 1871 to 1906 he was professor of English language and literature at the Sheffield Scientific School, Yale. He became specially of note as an authority on the works of Chaucer and Shakespeare and also as a profound student of the English language, these themes forming the subject of most of his scholarly writings. He received honorary degrees from Yale, Harvard, Lafayette, Princeton and Aberdeen, and was a member of the American Academy of Arts and Letters.

LOURDES (43° 6′ N., 0° 1′ W.), town, Hautes-Pyrénées, France, on river Pau; contains an ancient castle; famous place of pilgrimage, on account of sacred spring, whose waters are credited with many wonderful cures of cripples and other invalids; marble quarries.

LOURENÇO MARQUES, LORENZO MARQUES (25° 56′ S., 32° 27′ E.), capital, Portug. E. Africa, on Delagoa Bay; first founded as Portug. trading post in 1544; terminus of railway to Pretoria, by which large percentage of Rand imports and exports pass; has excellent harbor; coaling port. Pop. *c.* 10,000.

LOUSE. See LICE.

LOUTH (53° 55′ N., 6° 30′ W.), county, Leinster, Ireland; extends from Carlingford Lough in N. to River Boyne in S.; smallest county in Ireland; hilly in N., flat elsewhere; rivers Dee and Glyde enter Dundalk Bay. Ch towns: Dundalk (county town), Lout Drogheda, Ardee; chiefly agricultur oysters are found in Carlingford Loug Area, 316 sq. miles. Pop. 65,000.

LOUVAIN, or LÖWEN, tn., pro Brabant, Belgium (50° 53′ N., 4° 4 E.), 18 m. E. by N. of Brussels. Man factures beer, lace, starch, tobacc destroyed by the Germans in the Wor War. The Belgian forces retired fro the town (Aug. 19, 1914), when it w occupied by the Germans, who delibe ately set it on fire (Aug. 25). The fi lasted for a day and a half, and when died down this beautiful old uni town, 'the Oxford of Belgium,' lay ruins. The town half was spared, b the univ., with its famous library, w destroyed. The library was rebu largely through contributions from t colleges and universities of the Unit States. Pop. 45,000.

LOUVET DE COUVRAI, JEAN BAPTISTE (1760-97), Fr. author a politician; achieved sudden fame (178 by *risque* book, *Aventures du chevalier de Faublas*; became Jacobin and subs quently Girondist; made famous Cicer nian attack on Robespierre; forced in exile by the Mountain; persecuted b mob as terrorist on return; wro graphic *Memoirs*.

LOUVOIS, FRANÇOIS MICHEL LE TELLIER, MARQUIS DE (1639-9 Fr. statesman; app. Sec. of State f War, 1666; said to have restored troops order and discipline that Colbe had given to finances.

LOUVRE, THE, the greatest of t modern palaces of Paris, forming square of 576 ft. by 538 ft., was co nected with the Palace of the Tuileri by a great picture-gallery overlooki the Senie and 1456 ft. long. Betwe the two palaces lay the Place du Ca rousel, and Napoleon III. furth connected the two palaces on t northern side making them into o vast palace. The L. is erected on t site of an old 13th-century chatea the first part of the modern structu the S.W. wing, was built, after the d signs of Pierre Lescault, in 1541; whi the main portion of the square w built by Louis XIV. after the desi of Claud Pérrault. After the buildi of the Tuileries the L. proper becam a series of great galleries filled wi pictures, sculpture, Egyptian, Grec and Roman antiquities. The fire orig nated by the Communards in 187 which destroyed the Tuileries, on burnt the corner of the L. which co tained the library. See PARIS.

LOVAT, SIMON FRASER, 12TH BARON (*c.* 1667-1747), Scot. intriguer; compelled Dowager Lady L. to marry him, for which he was outlawed, 1701; went to France; planned Jacobite rising; suspected of treachery, imprisoned in Aquitaine for some years; escaped to England, 1714; engaged in Jacobite intrigue, playing traitor on various occasions; supported rising of 1745; taken prisoner after *Culloden*; executed for treason.

LOVEBIRD, a genus of birds of the parrot family. They are diminutive and are found in America, Africa and Australia.

LOVEJOY, ELIJAH PARISH (1802-1837), American Abolitionist. *b.* in Albion, Maine, *d.* in Alton, Illinois, He graduated from Princeton in 1833 and joined the Presbyterian ministry. He also edited the St. Louis Observer in which his anti-slavery articles aroused such opposition that he moved the paper to Alton, Illinois. Here a mob threw his press in the river, but with a new one given by friends he started the Alton Observer, in 1836. In November 1837 Lovejoy was shot and killed by a member of a mob attacking his warehouse.

LOVEJOY, OWEN REED (1866), sociologist; *b.* in Michigan. Graduated at Albion College 1891. 1891-1898 minister of Methodist Episcopal Church, 1899 - 1904 Congregational Church, Mount Vernon, New York. 1904-1907 assistant secretary, since 1907 general secretary, National Child Labor Committee. Since 1919 editor of The American Child. President of American Association of Social Workers. Member American Association for Labor Legislation. Member American Academy of Political and Social Science.

LOVELACE, RICHARD (1618 - 58), Eng. cavalier lyrist; *b.* at Woolwich; his selected poems were pub. in 1659 under the title of *Lucasta: Posthume Poems. To Althea from Prison* and *To Lucasta on going to the Wars* are among the best lyrics in the language.

LOVER, SAMUEL (1797-1868), a novelist and poet, achieved fame in 1826 with the well-known ballad of *Rory O'More*, which was, and is still, very popular. His best novel is the farcical *Handy Andy*, 1842; which achieved a great success, and this almost alone of his works of fiction is still read, but now principally by boys, *Rory O'More, A National Romance*, 1837, and *Treasure Trove*, 1844, being almost entirely forgotten. He wrote many songs and several plays, and one of the worst volumes of parodies ever issued, *Rival Rhymes*, 1859.

LOVTCHEN, MOUNT, mass of limestone mts., Jugo-Slavia (42° 24′ N., 18° 49′ E.), formerly Montenegro; formed citadel of defense to the cap. Cettinje. Its capture by the Austrians on Jan. 11, 1916, led to downfall of Montenegrin kingdom.

LOW, A(LFRED) MAURICE (1860), an Anglo-American author and journalist; *b.* in London, England. He was educated in Kings College, London and in Austria, then became a journalist and finally chief American correspondent of the London Morning Post. In 1900 he made a series of investigations of labor legislation in England for the U.S. Department of Labor. He was the author of *The Supreme Surrender*, 1901; *A Short History of Labor Legislation in Great Britain*, 1907; *The American People*, 1909; and *Woodrow Wilson, an Interpretation*, 1918.

LOW, SETH (1850-1916), municipal reformer and former Mayor of New York City; *b.* Brooklyn, N. Y. Graduating from Columbia in 1870, he entered his *f's.* tea and silk importing business and became a partner in 1875, so remaining till the business was liquidated in 1888. He became early interested in politics as a Republican. From 1881 to 1885 he was mayor of Brooklyn on an independent ticket, being twice elected. In 1890 he was appointed president of Columbia College, which under his administration was enlarged and developed into the present university. Its Low Memorial Library was built by him at a cost of $1,000,000. He resigned as president of Columbia in 1897 to become independent candidate of New York City, but was defeated. Nominated again in 1901 at the crest of a revolt against the power of Tammany Hall, he was elected on a fusion ticket. Meantime he served as a member of the American delegation at the Hague Peace Conference of 1899. During his mayoralty he made many reforms in the city's administration, notably in reduced taxation and the police department, and enlarged the public school system. He was defeated for re-election in 1903 by George B. McClellan. He headed the National Civic Federation from 1907 to his death. The leading American universities, as well as Edinburgh, conferred honorary degrees upon him.

LOW, WILL HICOK (1853), American artist. *b.* in Albany, New York, He studied art in Paris under Gerome and Carolus Duran 1873-1877. Is distinguished for portraits,

murals and stained glass, and as an illustrator. Silver medals Paris Exposition 1889. Chicago Exposition 1893, Buffalo Ex. 1901. Member of the Jury of Awards St. Louis Exposition. Painted the ceiling of the Waldorf reception room, 1892, panels for Astoria Hotel ball-room, and paintings for courthouses at Newark and Wilkesbarre, for the Federal Building, Cleveland, and St. Pauls, Albany, N. Y. Director life classes at Cooper Union, N.Y.C. 1882-1885, and of National Academy of Design 1889-1892. Among his more recent works are murals for New York State Education Building.

LOW COUNTRIES. See NETHERLANDS, BELGIUM.

LOWDEN, FRANK ORREN (1861), ex-Governor of Illinois; *b.* in Sunrise City, Minn. He graduated from the Iowa State University, in 1885, then studied law at the Union College of Law, in Chicago, where he began to practice. During 1899 he was professor of law at Northwestern University. In 1906 he was elected to the U.S. Congress as a Republican for an unexpired term, and re-elected in a few months later for the term 1907-11. He was Governor of Illinois from 1917 until 1921. In 1920 he was a prominent candidate for the Republican nomination for president.

LOWE, SIR HUDSON (1769-1844), Brit. general; served against France, 1793; defended Capri, which he had to evacuate, 1808 distinguished in campaigns of 1813-14; gov. of St. Helena, 1815-21, during Napoleon's captivity; commanded in Ceylon, 1825-30.

LOWELL, a city of Massachusetts, in Middlesex co., of which it is one of the county seats. It is on the Boston and Maine and the New York, New Haven and Hartford railroads, and on the Merrimac river. It includes several villages. The river here runs over the falls, which furnishes immense water power, which is utilized by the industries of the city. Lowell is one of the chief cotton communities in the world. It has also woolen and carpet mills, patent medicines, furniture and hosiery interests. The public institutions include St. Johns' Hospital, Lowell Hospital, Old Ladies' Home, St. Peter's Orphanage, State Normal School, Lowell Textile School, and Rogers Hall School. Among the public buildings are many churches and schools, and a city hall. Pop. 1920, 112,479.

LOWELL, A(BBOTT) LAWRENCE (1856), American writer and educator. *b.* in Boston. He graduated from Harvard in 1877, from the Law School in 1880, and practiced in Boston, 188 97. Lecturer at Harvard 1897-9 Professor of the Science of Governmer 1900, and in 1909 succeeded Charl W. Eliot as President of Harvard. Sin 1900 a trustee of the Lowell Institut Member of the American Academy Arts and Letters, honorary member the Royal Irish Academy. Publication *Transfer of Stock in Corporations,* wi Francis C. Lowell, 1884; *Essays Government,* 1889; *Governments and Pa ties in Continental Europe,* 1896; *Coloni Service* with H. Morse Stephens, 190 *The Influence of Parties in Englar and America,* 1908; *Public Opinion a Popular Government,* 1914.

LOWELL, AMY (1874), poet; Brooklyn, N.Y.; sister of Abbott Law rence Lowell, president of Harvar University, 1909. She became a lead of the free-verse or prose-poem scho poetry, developing an individual tec nique and a vividness of description ar imagery that put her works in the fro rank among the numerous free-ver poets of the twentieth century. H first book of poems, *A Dome of Ma Colored Glass,* was published in 191 Her later work includes *Men, Wom and Ghosts; Can Grande's Castles; Pictur of the Floating World,* 1919; and *Legend* 1921.

LOWELL, CHARLES RUSSEL (1835-64), Amer. soldier; killed in Ame Civil War, fighting for the North.

LOWELL, FRANCIS CABOT (177 1817), American manufacturer. in Newburyport, Mass.; *d.* in Bosto Graduated from Harvard in 1793 a began mercantile life in Boston. Wh on a visit to England he decided to t and introduce cotton manufacture the United States. The war wi Great Britain in 1812 hampered his fi efforts but with the help of Paul Mood a mechanic of Newburyport, a loom w constructed. In partnership with l brother-in-law, P. T. Jackson, a chart was obtained for the Boston Manufa turing Company, and what is believ to have been the first factory in t United States making raw cotton in cloth was established in Waltham, Ma

LOWELL INSTITUTE, established Boston in 1836 by a bequest of $250,0 left by John Lowell, 1799-1838, is foundation for the maintenance a support of public lectures upon philo ophy, natural history and the arts a sciences. The first lecture was deliver in 1839 by Edward Everett and sin then annual courses of lectures on t selected subjects have been deliver for the institute by leading exponer in the English-speaking world.

LOWELL, JAMES RUSSELL (1819-91), Amer. poet, journalist, essayist, diplomatist; *s.* of Unitarian minister of Boston, of Scot. descent; *m.* Maria White, 1844, and adopted her abolitionist and other political and social enthusiasms; pub. vol. of verse, 1841; joint-publisher of new magazine, *The Pioneer*, 1843; 1848 saw third vol. of poems, *Fable for Critics*, *Biglow Papers*, *Vision of Sir Launfal*, all showing combination of wit and sentiment which was his characteristic. Reforming zeal was the inspiration of much of his verse, which, however, contains some purely pastoral efforts. L. succeeded Longfellow at Harvard Coll., 1855, and subsequently wrote much criticism, his *My Study Windows* and *Among My Books* giving him high rank as literary essayist; editor of *Atlantic*, 1857; joint-editor of *North American Review*, 1863; pub. *Under the Willows*, 1869; *The Cathedral*, 1870; *Heartsease and Rue*, 1888; ambassador to Spain, 1877; to England, 1880-85.

LOWELL, JOHN (1799-1836), member of noted Massachusetts family; founder of Lowell Institute at Boston, a public establishment for the provision of free lectures; endowment, $237,000. His *s.*, Francis Cabot, 1775-1817, founded Lowell city, and introduced cotton manufacture into U.S.

LOWELL, ORSON (1871), cartoonist and illustrator. *b.* in Wyoming, Ia.; 1887 graduated from Chicago Schools; 1887-93 student at Chicago Art Institute. Since 1893 in New York. Illustrator of many books and has done work for periodicals and magazines. Cartoonist since 1907 for a number of New York magazines. Member of Society of Illustrators.

LOWELL, PERCIVAL (1855-1916), an American astronomer, *b.* in Boston, Mass. He graduated from Harvard University, in 1876, then spent a long period in Japan and Korea, returning in 1894 as the councillor and foreign secretary of the Korean Special Mission to the United States. Later he established the Lowell Observatory, and in 1900 sent an expedition to Tripoli to observe the transit of Mars, sending another expedition in 1907 to make photographic observations of the same event. He was recognized as a leading authority on astronomy and especially on the planet Mars, of which he had made almost a life-long study. Among his works are *Occult Japan*, 1894; *Mars*, 1895; *The Solar System*, 1903; *Mars and its Canals*, 1906; *Mars as the Abode of Life*, 1908, and *The Evolution of Worlds*, 1909.

LOWER CALIFORNIA, a peninsula about 750 m. long and averaging 75 m. in breadth, which forms a territory of the Mexican republic, from the rest of which it is separated by the Gulf of California. It is healthy and dry, but the surface is too mountainous to be of much use for agriculture. Mining of copper, silver, and gold is carried on to a certain extent, and the fisheries are fairly productive. Capital, La Paz. Pop. 52,244. Area 58,328 sq. m.

LOWESTOFT (52° 29′ N., 1° 44′ E.), seaport and seaside resort, Suffolk, England, on North Sea; old town stands on cliff forming part of Lowestoft Ness, most easterly cape in England. Pop. 1921, 44,326.

LOYAL LEGION OF THE UNITED STATES, Military Order, founded May 3, 1865, by officers of the Civil War as a fraternal association, and for the relief of widows and orphans of dead comrades. Eligible to membership are commissioned officers and honorably discharged officers of the army, navy, and marine corps, regular, or volunteer, who were engaged in the suppression of the Rebellion prior to April 15, 1865. Original companions of the 1st class include all midshipmen and cadets who performed services in the war. Hereditary companions of the first class are direct male descendants, who have reached 21, of deceased members of the 1st class, and of dead officers not of the order, but eligible. Second Class. Sons, or grandsons, of original companions of the 1st class, whether, originally, by inheritance, or succession, who have reached 21. Third class. Civilians conspicuous for helping the war and assisting the government, and who before April 15, 1890 were elected members of the order. Headquarters, Philadelphia. Membership, 5407; Commander-in-Chief General Nelson A. Miles.

LOYALISTS (in Amer. Revolution), colonists who remained in their allegiance to England during War of Independence; favorite subject of Amer. history and biography; formed about one-third of total population and probably represented element which had not inherited spirit of religious and political revolt. Their elimination by war, confiscation, and exile gave unity to heterogeneous Amer. character. Great Britain secured terms for them by treaty, 1815.

LOYALTY ISLANDS (21° 20′ S., 167° 25′ E.), group of islands in S. Pacific, belonging to France; dependency of New Caledonia.

LOYOLA, ST. IGNATIUS OF (1491-1556), Inigo Lopez de Recalde, founder

of the Society of Jesus, was of noble Span. birth, and went as a page-boy to the Span. court; and being courageous and energetic, became a soldier. While fighting in Navarre in 1521, he was injured at the siege of Pampeluna, and while recovering began to repent of his worldly ways. Entering the Abbey of Montserrat in 1522, he led a life of devotion; afterwards went to Rome, and then on pilgrimage to Jerusalem; coming back to Italy, was viewed as a heretic by the Inquisition; continued his wanderings in Spain and then in Paris and Italy; ordained priest, 1538. While in Rome in 1537 he saw vision of Christ which led him to found the Society of Jesus, which was sanctioned by Pope Pius III. in 1540, and of which he himself was elected general in 1541. L. drew up the *Constitutions* of the Order, and finished his *Spiritual Exercises*; devoted the rest of his life to the Society. He was beatified in 1609; canonized, 1629.

LOYOLA UNIVERSITY, an educational institution in Chicago, Ill. It developed from St. Ignatius College, founded by priests of the Society of Jesus in 1869, now the art department of the University. In 1906 the trustees bought 20 acres on the north shore and erected there Loyola Academy and the Michael Cudahy Science Hall. The Lincoln College of Law dates from 1908. In 1917 the University trustees bought the Chicago College of Medicine and Surgery and under that name it is used as the Medical Department. The Department of Sociology was established in 1913. There are also two High Schools conducted by University teachers. Students, 800; teachers, 52 (1922-23).

LOZÈRE (44° 40′ N.; 3° 30′ E.), department, S.E. France, formed from ancient Gevaudan in Languedoc; mountainous; rich in minerals; cattle and sheep rearing, silkworm breeding; manufactures cheese; capital, Mende. Pop. 125,000.

LUANG-PRABANG (19° 54′ N.; 102° 10′ E.), chief town, Laos, Fr. Indo-China, on Mekong. Pop. *c.* 13,000.

LUBAO (15° N.; 120° 30′ E.), town, Luzon, Philippine Islands. Pop. 20,000.

LUBBOCK, SIR JOHN. See AVEBURY.

LÜBECK. (1) Free city, cap. of Lübeck republic, Germany (53° 51′ N., 10° 41′ E.), on Trave, about 12 m. from Baltic; once head of Hanseatic League; now prominent fort, trading chiefly with Baltic countries. Lübeck was founded in 12th cent.; became free city of the empire, 1226; conquered by French, 1806; recovered independen 1815. It is a picturesque old town, w quaint gables and late Gothic a Renaissance architecture. Among t striking buildings are Marienkirc 1276-1310, with fine paintings a sculptures; Domkirche, founded Henry the Lion; 12th-14th cent. alt piece by Memling; churches of Catherine and St. James, 14th cen Rathaus, 13th-15th century; Goth Holstentor, 15th cent. gateway. Ch industries are shipbuilding, machine chemicals, breweries, brushes, soa cigars, food-stuffs, etc. Pop. 98,6 (2) Republic, governed by senate a house of burgesses; fertile; cereals, fru Area, 115 sq. m.; pop. 116,500.

LÜBKE, WILHELM (1826-93); German art historian, born at Do mund. From 1861-66 he was profes of art and history at Zürich, and th held a professorship in the art scho of Stuttgart. He wrote numerous v uable works, including *History of A* and *History of Sculpture.*

LUBLIN. (1) Government, Polan undulating surface, and largely forest cereals, flax, hemp. Area, 6,297 sq. m pop. 1,481,000. (2) Town, cap. of abo (51° 15′ N., 22° 32′ E.); manufactu thread, hemp, linen, and woolen goo and has soap, tobacco, and sugar f tories. Taken by Germans on July 1915. Pop. 69,900.

LUBRICANTS, substances which a used to minimize the friction betwe moving parts of machinery are classifi as lubricants. They function by s arating the metallic surfaces, there preventing abrasion, and in most stances substituting for the fricti developed between solids the mu smaller amount which is develop between a solid and a liquid. T frictional coefficient of a bearing m diminish on lubrication from 0.3 0.0006.

Lubricants may be solid (graphite soapstone), semisolid (greases and hea oils), or liquid (light oils). While frictional coefficient between the bear and the lubricant itself increases w viscosity, in general the greater viscosity, the greater the load the bear can carry.

The characteristic property of a go lubricant is its ability to maintain unbroken film. This quality depe on the surface tension, which is hig with heavy lubricants, hence th efficiency with greater loads. The films of bearings at rest tend to ruptu and the friction developed on sett such a bearing into motion is necessa greater until the rotation of the jour re-establishes the film.

Graphite, emulsified with grease, vegetable and animal oils and fats, and mineral oils may be used either singly or in mixtures utilizing the desirable properties of each variety. Oils which become acid (vegetable and animal fats, so-called fixed oils) attack the metal of the bearing and should not be used where they are exposed to undue heating. The fixed oils also tend to oxidize on standing. This may result in their thickening to such an extent that they cannot flow onto the bearings. Such oxidation is always accompanied by heat, and may be the cause of a fire if the oil is contained on cotton waste or other nonconducting inflammable material, (phenomenon of spontaneous combustion). Mineral oils are free of both these defects.

LUBRICATION, AUTOMOBILE. See AUTOMOBILE.

LUCAN, MARCUS ANNÆUS LUCANUS (A.D. 39-65), Rom. poet; *b.* Corduba, Spain. His success roused Nero's jealousy, and he was forbidden to recite in public; indignation prompted L. to join the Pisonian conspiracy; on the discovery of the plot he was compelled to end his life; great work is the *Pharsalia*, a rhetorical poem dealing with the conflict between Cæsar and Pompey.

LUCANIA, former name of region between Gulf of Tarentum and Tyrrhenian Sea, S. Italy; now included in provinces of Basilicata, Cosenza, and Salerno; surface mountainous; inhabited by Lucani from V. cent. B.C.; subdued by Rome in 272 B.C.; supported Carthage in Hannibalic War.

LUCARIS, CYRILLOS (1572-1637 patriarch of Constantinople; tried to make Eastern Church Calvinistic.

LUCAS, CHARLES (1713-71), Irish physician and politician; at first an apothecary in Dublin; compelled to flee abroad on account of his political opinions; studied med. in Paris and Leiden, and commenced practice as physician in London; pardoned and elected to Irish Parliament as member for Dublin; noted for defense of independence of Irish Parliament; wrote many political pamphlets.

LUCAS, EDWARD VERRALL, Eng. author, essayist, and editor; has ed. works of Charles and Mary Lamb; produced in collaboration with C. L. Graves a series of humorous works, including *Wisdom While You Wait, Change for a Halfpenny, If*, etc. Among his other works are, *Highways and Byways, A Wanderer in Holland, Landmarks, A Boswell of Baghdad, The Phantom Journal, Verena in the Midst*, 1920, and (with George Morrow) *Quoth the Raven*.

LUCAS, VAN LEYDEN (*c.* 1494-1533), Dutch painter and engraver; an intimate of Mabuse and Albrecht Dürer; dealt successfully with sacred history and contemporary manners and portraits.

LUCAYOS ISLAND. See BAHAMAS.

LUCCA (43° 51′ N., 10° 31′ E.), town, Tuscany, Italy; was free city in XIV. cent.; became principality in 1805, when Napoleon gave it to his sister, Princess Bacciochi; afterwards became duchy, and was incorporated with Tuscany, 1847; annexed to Italy, 1860. L. is seat of archbishopric; has cathedral dating in part from XI. cent., and containing fine pictures; many old churches, palaces, educational establishments; old fortifications remain; manufactures silk. Pop. of town, 31,000; of commune, *c.* 77,000.

LUCCA, BAGNI DI (43° 51′ N., 10° 31′ E.), watering-place, on Lima. Lucca province, Italy.

LUCCHESINI, GIROLAMO (1751-1825), Prussian diplomat; ambassador to Poland, 1789; arranged Prusso-Polish alliance, 1790; ambassador to Vienna, 1793; Paris, 1802; tried to maintain friendly relations between France and Prussia.

LUCENA (37° 35′ N., 4° 32′ W.), town, Cordova, Spain, on Casajar; earthenware. Pop. 25,000.

LUCERA (41° 30′ N., 15° 21′ E.), town, Foggia, Italy; cathedral and castle; silk. Pop. 17,500.

LUCERNE, a genus of leguminous plant comprising over ninety species. It includes several valuable pasture plants. In the United States the lucerne is known as alfalfa.

LUCERNE, LAKE OF, VIERWALDSTATTERSEE (47° N., 8° 30′ E.), 'Lake of the Four Forest Cantons,' Switzerland; surrounded by cantons of Lucerne, Unterwalden, Schwyz, and Uri; area, 44 sq. miles; overlooked by Mount Pilatus and Rigi; traversed by the Reuss; beautiful scenery; associated with William Tell.

LUCERNE, LUZERN.—(1) (47° 10′ N., 8° 10′ E.), canton, Switzerland; hilly and mountainous; chief stream, the Reuss; agriculture and dairy-farming; joined Swiss confederation, 1332. (2) (47° 3′ N., 8° 18′ E.), town, capital of above; beautifully situated on Lake of L.; popular tourist resort; old walls and watch-towers (erected, 1385), an-

cient town hall, Hofkirche, museum, arsenal (old armour), *Lion of Lucerne* monument, glacier garden, etc. Pop. 45,000.

LUCHAIRE, DENIS JEAN ACHILLE (1846-1908), Fr. historian; prof. of History at the Sorbonne; wrote several works particularly on Pope Innocent III.

LUCHU ISLANDS (24° to 30° N., 122° 30′ to 130° E.), group of some 50 volcanic and coralline islands belonging to Japan, half-way between Kiushiu and Formosa; total area, 930 sq. miles; largest islands, Okinawa and Amami; chief towns, Shuri (capital) and Nafa, most important seaport and trading center; annexed by Japan despite China's threatening attitude in 1879; produce sugar, sago, dyewoods, aromatic oranges. Pop. 457,000.

LUCIA, ST. See **St. Lucia.**

LUCIAN (*fl. c.* 200 A.D.); **Silver-Age** Gk. writer; *b.* Samosata, Syria; after unsuccessful apprenticeship to his uncle, a sculptor, turned his hand to oratory; seems to have prospered; eventually obtained a well-paid post in Egypt as recorder of legal actions and keeper of State documents. L. wrote a very large number of treatises and dialogues (in the Platonic style), mostly satires on current abuses and on philosophers. He believed little of what was taught either in philosophy or religion. His style is elegant and correct, although it naturally contains a few Silver-Age words and constructions (notably his use of *Kan*). Best-known work is his *True History*, a classical Baron Munchausen describing the exciting adventures of some voyagers to the moon; written to ridicule hist. poets and historians from Homer downwards. In *De morte peregrini* L. shows knowledge of Christianity, which he treats with scant respect.

LUCIFER ('Light-Bringer'); *Venus* (*q.v.*) as Morning Star; (myth.) son of Aurora (dawn); Satan, supposed to have fallen from heaven (*cf. Isaiah* 14^{12}, *Luke* 10^{18}; *Revelation* 9^{1}, *sqq.*); friction match containing phosphorus, dating from *c.* 1830.

LUCILIUS, GAIUS (*c.* 180-103 B.C.), Rom. satirist; *b.* Suessa; served in the Numantine War under Scipio, and despite his humble origin lived on terms of the closest familiarity with Scipio and Lælius; regarded as the first great Rom. satirist. He wrote with great ease and variety, but his work lacks polish and finish. In his satire he is more personal than Horace.

LUCKENWALDE (52° 7′ N., 13° 9′ E.), town, Brandenburg, Prussia, on Nuthe; cloth. Pop. 25,000.

LUCKNOW (26° 52′ N., 80° 58′ E city, India, on Gumti; formerly capit of independent state of Oudh; chi building, the mausoleum Imambar for heroic defense and relief in Indi Mutiny, 1857-58; muslins, embroider brassware, pottery. Pop. 1921, 243,55

LUCRETIA, a celebrated Roma matron, the wife of Lucius Tarquinii Collatinus, and the daughter of Lucr tius. According to the story, a numb of Roman soldiers in camp quarrele as to the respective virtue of their wive and, in order to test the truth of the assertions, returned unexpectedly t Rome to see how their wives we occupied. L. alone was found loy to her husband, busily occupied household matters. Her beauty an innocence roused the passion of Sextu Tarquinius, who visited her at nigh and ravished her. In the morning sh told her father and her husband of h shame and then stabbed herself. H rape roused the Romans to shake o the hated rule of the Tarquins.

LUCRETIUS, TITUS CARUS (*c.* 9 55 B.C.), Rom. poet; according to trad tion, was poisoned by love-potion, an wrote during intervals of sanity. H poem, *De Rerum Natura*, in six books hexameters, treats of Epicurean philos phy, but is interspersed with man remarkably clever conjectures and the ries regarding the atomic origin of th world, mankind, etc. He bears n great love to the Rom. pantheon, an condemns superstition as one of man burdens. L. is one of the most chara teristically Roman of all Lat. writers.

LUCRINE LAKE, LUCRINUS LACU (40° 51′ N., 14° 5′ E.), small lake, coast of Campania, ancient Ital oyster-beds.

LUCULLUS, LUCIUS LICINIUS 109-56 B.C.), one of greatest orato gov's, and generals of Rome; subject one of Plutarch's *Lives*; consul, 74, an by death of pro-consul became lead of forces against Mithridates; resc Rom. gov. of Bithynia and conquer Pontus, 74-2; overran large part Armenia; recalled by enemies at hom abandoned ambition, and became famo as art amateur and voluptuary.

LUCY, SIR THOMAS (1532-160 Lord of Charlecote, Warwickshire, En in Shakespeare's early days; model f Justice Shallow; according to lege Shakespeare stole his deer.

LUDENDORFF, ERIC VON (1865 German soldier, joined the Prussi infantry, in which he became a re mental commander. For many yea

he was on the general staff, being engaged in Operations Department, 1904-13, of which he was latterly chief. In 1912 raised to rank of colonel, and in 1914 was promoted major-general. At the outbreak of the World War he was brigade commander at Strasbourg. Under mobilization orders he was appointed deputy chief of staff of the 2nd Army (von Bülow), and was entrusted with the duty of coordinating von Emmich's plans in the siege of Liége with von Bülow's probable dispositions. Though he had no authority to give orders, he took command of a brigade and was the first German to enter the citadel. For his services he received the order *Pour le Merite*. Next he was appointed chief of staff of the 8th Army in E. Prussia under von Hindenburg, with whom he was associated throughout the rest of the war. Together they won the battles of Tannenberg and of the Masurian Lakes, and devised the great drive against the Russians in 1915. After the failure of the Ger. offensive against Verdun, 1916, Hindenburg was appointed chief of the general staff, and Ludendorff accompanied him as first quartermaster-general. He was expressly assured that he would have joint responsibility in all decisions and measures that might be taken. As he tells in his two volumes, *My War Memories, 1914-18*, he found the situation on the Somme, as a result of the Allies offensive, difficult and dangerous. By retreat to the Hindenburg (Siegfried) Line early in 1917, a breakdown of the Ger. resistance was avoided. With the tremendous effort made in 1918 to achieve a final decision in the West, the name of Ludendorff will ever be connected. His grandiose design of separating the Brit. and the Fr. forces almost succeeded, and had he persisted in hammering away at Amiens instead of transferring his blows to the Lys and elsewhere, he might have gained his end. As events dramatically proved, he underestimated the resources of his opponents and took risks which proved his undoing. He tendered his resignation, which was not accepted. Germany's fortunes went from bad to worse, and on Oct. 25 Ludendorff was relieved of his office. He was active in 1922-3 in political intrigues to restore the monarchy to power.

LÜDENSCHEID (51° 13′ N., 7° 46′ E.), town, Westphalia, Prussia; metal goods. Pop. 35,000.

LUDHIANA (30° 52′ N., 75° 55′ E.), town and district, Jalundhar division, Punjab, India; shawls; trade in grain. Pop. *c.* 49,000.

LUDINGTON, a city of Michigan, in Mason co., of which it is the county seat. It is on the Pere Marquette and other railroads and on Lake Michigan. It is the center of an important salt and fruit growing region. It has an excellent harbor and its industries include lumber mills, machine shops, foundries, etc. Pop. 1920, 8,810.

LUDLOW, EDMUND (*c.* 1617-92), Eng. regicide; held commands for Parliament in Civil War; signed warrant for king's execution; brought to a close Cromwellian subjugation of Ireland 1651-52; opposed protectorate; sentenced, 1660, but fled abroad.

LUDLOW, JAMES MEEKER (1841) Clergyman. *b.* at Elizabeth, New Jersey. Graduated at Princeton College in 1861; and from Princeton Theological Seminary in 1864. 1864 ordained Presbyterian Minister; 1865-69 pastor First Church, Albany; 1869-77 Collegiate Church; 1877-85 Westminster Church, Brooklyn; 1886-1909 Munn Avenue Church, East Orange; 1909 pastor emeritus. Trustee Union Theological Seminary, Whittier House Social Settlement, Jersey City. Member American Geographic Society, American Civic Association. Author of: *A Man for A' That*, 1880; *Concentric Chart of History*, 1881; *Captain of the Janizaries*, 1886; *A King of Tyre*, 1890; *That Angelic Woman*, 1890; *Deborah*, 1901; *Incentives for Life*, 1902; *Sir Raoul*, 1905; *Jesse Ben David*, 1907; *Judge West's Opinion*, 1908; *The Discovery of Self*, 1910; *Avanti*, 1913; *Along the Friendly Way*, 1919.

LUDLOW, WILLIAM (1843-1901), an American soldier, *b.* in Islip, L.I., N.Y. He graduated from West Point Military Academy, in 1864, served through the Civil War under Sherman, was president of the U.S. Nicaraguan Canal Commission in 1895 and Engineer in-Chief of the U.S. Army during the Spanish-American War. During 1898-1900 he was military Governor of Havana, Cuba, and showed marked ability as an administrator in reorganizing the local government.

LUDWIG. See Louis.

LUDWIG I. (1786-1868), king of Bavaria; *b.* at Strassburg; led Bavarian opposition to France; had share in forming Bavarian constitution; succ., 1825; opposed Jesuits; improved financial affairs; encouraged learning and art; furthered economic improvements; promoted founding of Zoll-Verein, 1833; aided Greece in struggle for independence against Turkey, his son becoming king of Greece, 1832; gave largely to

charitable objects; influenced in political matters by dancer, Lola Montez, which led to revolution, 1848, when L. had to abdicate; retired to private life.

LUDWIG II. (1845-86), king of Bavaria; succ., 1864; opposed Prussia in Schleswig-Holstein affair; joined Austria against Prussia, 1866; defeated; subsequently reformed army; aided Prussia against France, 1870-71; offered imperial crown to William of Prussia, 1871. His friendship with Richard Wagner roused opposition in country; interested in art, lit., and philosophy; built many magnificent castles and Bayreuth theatre; suffered from mental weakness, which ultimately developed into incurable insanity; deposed, 1886; drowned himself in Starnberger See a week later.

LUDWIG, KARL FRIEDRICH WILHELM (1816-95), Ger. physiologist; prof. of Anat. and Physiology at Zürich, 1849, at the military medical school in Vienna, 1855; prof. of Physiology at Leipzig, 1865; investigated gland secretions and secretory nerves, blood pressure, and blood and lymph, and numerous other physiological subjects; greatly influenced modern development of physiology, introducing valuable new methods, in addition to making many important discoveries; author of *Textbook of Physiology*.

LUDWIGSBURG (38° 53′ N., 9° 12′ E.), town, Württemberg, Germany; important military dépot. Pop. 25,000.

LUDWIGSHAFEN (49° 28′ N., 8° 27′ E.), town, Bavarian Palatinate, on Rhine; chemical works. Pop. 95,000.

LUFBERY, RAOUL SERVAIS (1891-1918), World War aviator and member of the American Escadrille of the French Foreign Legion; *b.* Wallingford, Conn.; *d.* Toul, France. He was of French descent, and as a boy of seventeen left his home for foreign parts in search of adventure. He visited France, worked in Turkey, and wandered through Europe, Africa and South America. Enlisting in the U.S. Army, he was sent to the Philippines, and on being mustered out traveled in China, Japan and India, where he worked in Bombay as a ticket-collector. In Saigon, Cochin China, he learned to fly and became assistant to a French aviator there. When the World War broke out he went to France and succeeded in joining the American Escadrille. His many exploits in downing German airships won for him the French Croix de Guerre and Medaille Militarie, the British Military Cross and the cross of the Legion of Honor. In May, 1918, he was killed over the American sector at Toul in an attem to bring down one of Germany's impro ed machines, an armored flying tan two-engined, two-gunned, its pilot a gunners in armor. His aeropla caught fire and he plunged to his dea from its flames.

LUGANO (46° N., 8° 56′ E.), ch town, Swiss canton of Ticino, on La Lugano; tourist center. Pop. 13,00

LUGANO, LAKE OF (46° N., 9° E lake of Switzerland and N. Italy; ancie *Ceresius Lacus*.

LUGANSK (48° 35′ N., 39° 10′ E town, Ekaterinoslav, Russia, on Luga coal-mining center; iron manufactur Pop. 35,000.

LUGGER, boat with one to thr masts with square sail ('lugsail') on eac

LUGO.—(1) (43° N., 7° 30′ W maritime province, Galicia, Spain; mou tainous. Pop. 480,000. (2) (43° N 7° 31′ W.), capital of above, on Minh textile industries; sulphur baths vicinity. Pop. 30,000.

LUGO, a town of Central Italy, the prov. of, and 14 m. W. of the city Ravenna. It has a large annual fa held in September, and manufactur wine and hemp. Pop. (com.) 30,00

LUGOS (45° 41′ N., 21° 53′ E town, Hungary, on Temes; wine. Po 16,500.

LUINI, BERNARDINO (*c.* 146 1540), Ital. painter, and pupil of Lec ardo da Vinci (*q.v.*); executed fresc at Milan and Lugano, and paint several easel works, including *T Daughter of Herodias*, now in the Louv Ruskin praises him.

LUKE, GOSPEL OF ST., third a longest of three Synoptic Gospe based largely on *Mark* (*q.v.*), and, li *Matthew* (*q.v.*), on collection of sayi of Jesus, and material peculiar to its (specially in chapters 1-3 and some parables); traditionally work of Luke, physician and companion of Paul, and recent criticism has do much to support this; forms wi *Acts* continuous hist. work; differs several points from *Matthew* and *Ma* (*e.g.*) in Passion narrative; tone of L Gospel is Gentile, and shows spec sympathy with women, sufferers, a sinners; used by Justin Martyr (and mutilated edition by Marcion, *c.* 15

LUKE, ST., a Gk. physician, frie and companion of St. Paul; probab wrote Third Gospel and *Acts*; said have died in Bithynia, aged 74; probab collected traditions in Palestine a

Asia Minor for his writings, into which he infused something of his own personality.

LUKS, GEORGE BENJAMIN (1867), American artist. *b.* in Williamsport, Pa. Studied at the Pennsylvania Academy of Fine Arts, the Düsseldorf Academy, Germany, and in Paris and London. War correspondent and artist for the Philadelphia Bulletin in Cuba 1895-96. Was awarded the Temple gold medal by the Pennsylvania Academy of Fine Arts; the Logan medal by the Chicago Art Institute; the Hudnut water-color prize, New York, and the Corcoran Art Gallery prize, Washington, D.C.

LULLY, RAIMON, RAYMOND LULL (*c.* 1235-1315), mediæval philosopher, known as 'the enlightened doctor'; *b.* Majorca; becoming a Christian, endeavored to convert Moslems by appeal to their higher reason; founded college of missionaries in 1276; failed to interest the pope in his plans; martyred in Tunis.

LUMBAGO, rheumatism of muscles of the small of the back, probably an inflammation of the fibrous tissue of the muscle also affecting the nerves, characterized by intense pain on movement; treatment is rest, fomentations on affected part, and a saline laxative, while sodium salicylate, aspirin, counter-irritants, or electricity may be beneficial. See RHEUMATISM.

LUMBER INDUSTRY, the production and manufacture of timber for building purposes. It has three branches, logging, or the felling, cutting and transporting of timber to the mill, conducted largely by saw-mill owners or operators; the saw-mill operations, with their output of saw logs and rough lumber, including beams, joists, scantlings, boards, shingles, laths, etc.; and the planing mill. Much of the lumber becomes manufactured, in addition to building equipment, into telegraph poles, shipbuilding material, railroad ties, pulpwood, paving blocks, and wood for furniture.

There are great logging camps in the timber regions of the United States, where the industry is organized to conform to natural conditions, topography, water and rail transport, and weather. Power logging has highly developed in the Pacific Northwest, where ocean rafting is also common. In 1922 there was a production of 32,000,000 thousand board feet of timber, the chief producing states being Washington, Louisiana, Oregon, Mississippi, Alabama, Arkansas, North Carolina, Texas, California, Florida, Wisconsin and Virginia. The number of active saw mills numbered 29,534. Among a large variety of woods cut, yellow pine led with 13,062,938 thousand board feet, followed by douglas fir, oak, hemlock and white pine in much less quantities. Other woods cut in still less volume were spruce, maple, red gum, cypress, chestnut, redwood, larch, birch, beech, cedar, yellow poplar, white fur, elm, basswood, hickory, ash, cottonwood, typelo, sugar pine, balsam fir, walnut and sycamore. Redwood is cut only in California, where also sugar pine almost wholly comes. From hardwoods (mostly beech, birch and maple), wood alcohol, charcoal, acetates, tar and tar oils are distilled. Tar and tar oils and charcoal, as well as rosin, turpentine and wood creosote, are distilled from softwoods.

For many years past there has been a serious diminution in the supply of lumber in the United States through wasteful cutting (see FORESTRY), and conservation has been resorted to for the protection of the forests. (See CONSERVATION). Other lumbering-producing countries besides the United States are Canada, Russia, Sweden, Germany and France, while the tropics, largely through enterprising colonization, furnish much mahogany, ebony, rosewood and other valuable woods.

LUMBINI, a garden near Bhagwanpur, Nepal, India, the traditional birth-site of the Buddha. A pillar with an inscription was put up by the Emperor Asoka, 248 B.C. This was found in 1895.

LUMINOSITY. See LIGHT.

LUMMIS, CHARLES FLETCHER (1859), an American writer, *b.* in Lynn, Mass. He studied at Harvard University, without graduating, then went out West, was for a while city editor of a Los Angeles newspaper, and for five years made a study of the Pueblo Indians. He has traveled extensively throughout the West and South America. Among his books are *A New Mexico David,* 1891; *Some Strange Corners of Our Country,* 1892; *The Awakening of a Nation; Mexico To-day,* 1898, and *My Friend Will,* 1911.

LUNA, PEDRO DI (*d.* 1422?); Span. antipope, Benedict XIII.; supported Clement VII., and was himself elected pope by Fr. party at Avignon, 1394; refused to accept deposition by Council of Constance, 1417.

LUNACY. See INSANITY.

LUNAR YEAR. See CHRONOLOGY.

LUND (55° 39′ N., 13° 11′ E.), city, Sweden, on Höjea; bp.'s see; seat of univ., founded, 1866. Pop. 25,000.

LUNDY'S LANE, BATTLE OF, a bitterly fought but undetermined conflict waged in the War of 1812 between Amer. and British troops along a road of this name in Ontario, near Niagara Falls. The engagement is also known as the battle of Niagara and the battle of Bridgewater. It took place on July 25, 1814. The combatants were unequally matched in numbers, the British being credited with about 4500 men and the Americans with about 3000. The Americans were successively led by Generals Scott and Jacob Brown and the British by General Riall. A small American force first met the British and held the field in an exhausting fight till the arrival of the main body. The British were also reinforced. The final conflict subsided well after dark to a withdrawal of both sides, neither being disposed to renew the attack. The Americans retired to Fort Erie. Their losses amounted to 171 killed, 571 wounded, and 110 captured or missing; the British lost 84 killed, 559 wounded and 42 prisoners.

LÜNEBURG (53° 15′ N., 10° 25′ E.); town, Hanover, Prussia, on Ilmenau, one of the ancient Hanse towns; has several old Gothic churches and some interesting mediæval buildings; manufactures cement and salt. Pop. 30,000. Lüneburger Heide (53° 3′ N., 10° 10′ E.), moorland district, Hanover, Prussia, between Aller and Elbe.

LUNEVILLE (48° 35′ N., 6° 30′ E.), town, Meurthe-et-Moselle, France; cotton and woolen industries; noted riding-school; birthplace of Emperor Francis I. Pop. 25,000.

LUNG-CHAU (22° 24′ N.; 106° 42′ E.), treaty town, Kwangsi, China. Pop. c. 14,000.

LUNGS, the main organs of respiration, two in number, situated in cavity of the thorax, above, behind, on each side of, and, to a slight extent, in front of the heart. Each lung is cone-shaped, the apex reaching to root of the neck and the base resting on the diaphragm, while right lung, which is the larger, is composed of three lobes, and left of two lobes. See RESPIRATORY SYSTEM.

LUPERCALIA, an ancient Rom. festival, held on Feb. 15, in honor of Lupercus, god of fertility, and one of the oldest pastoral deities of Italy.

LUPINE, a hardy plant, annual and perennial. It has gaily colored flowers and is a favorite garden plant.

LUPULIN, a fine yellow powder of hops which contains the bitter principl It consists of small round glands and obtained by drying, heating and siftin pods.

LUPUS, tuberculosis of the ski running a prolonged and chronic cours most commonly affects persons unde twenty, and generally attacks the nos and neighboring part of the cheek ulceration taking place; treatment the injection of new tuberculin, or appl cation of X-rays or Finsen light ray and application of salicylic acid t destroy diseased tissue, along wit plenty of fresh air and cod-liver o See TUBERCULOSIS.

LURAY CAVERN (38° 33′ N., 7 22′ W.), cave near Luray village, Virgini U. S.; discovered 1878, and noted f its remarkable stalactites and stala mites; these include a number of colum over 50 ft. in height, the colors rangi from white to red, yellow, brown, an blue. There are many different chan bers, which are lit by electricity. Trac of wild animals remain, and a huma skeleton has been found.

LURGAN (54° 28′ N., 6° 20′ W. market town, Armagh, Ireland; linen Pop. 15,000.

LURIA, ISAAC BEN SOLOMO (1534-72), Jewish hermit; *b.* Jerusalen led a hermit's life on the banks of t Nile, where he had visions and dream he transformed Judaism, but the chi beauty of his doctrine was his inte pretation of the Sabbath.

LURISTAN (33° N., 48° E.), mou tainous province, W. Persia, borderi on Turkey.

LUSATIA, district, Germany, betwe Oder and Elbe, N. of Bohemia; compri ed Upper and Lower Lusatia; belong to Saxony from 1635-1815, when Low Lusatia and part of Upper Lusatia we ceded to Prussia.

LUSHAI HILLS (23° 20′ N., 93° E. mountainous district, India, on fronti of Assam, Bengal and Burma.

LUSIADS, THE, see under CAMOEN LUIS DE.

LUSIGNAN (46° 27′ N., 0° 8′ E. town, Vienne, France; XI.-cent. churc

LUSITANIA, one of the three pro inces into which Augustus divide Hispania, ancient Spain, the two othe being Tarraconensis and Bœtica. was called after the tribe Lusitan and in extent corresponded very close to modern Portugal. The Roman se of government was Augusta Emeri (Merida).

LUSITANIA, Cunard liner, launched at Clydebank in 1906; was 785 ft. long and 88 ft. wide, and had a displacement of about 40,000 tons and a speed of 25 knots. She was fitted to carry 2,800 passengers, and had a crew of 651. During the World War, while crossing from America with 1,255 passengers on board, she was torpedoed by a Ger. submarine, May 7, 1915 off the Old Head of Kinsale, nearly 1,500 lives being lost. Over a hundred Americans lost their lives, and the Amer. Government sent a Note of warning to the Germans regarding their methods of submarine warfare, the evasive and unsatisfactory reply to which aroused great indignation in U.S., and was one of the factors leading to Amer. participation in the war.

LUSSIN, LOSSINI (44° 35′ N., 14° 25′ E.), island in Adriatic, belonging to crownland of Istria, Austria; ancient *Apsorus.* Pop. 1911, 12,947. Capital, Lussinpiccolo. Pop. 8340.

LUSTRATION (Lat. *lustro,* purify), ceremonial washing which occurs in many religions: thus contact with a corpse involves uncleanness which has to be washed away; at first there is no clear distinction between ritual and moral uncleanness.

LUTE (Arabic *Al'ud,* 'the wood'), an ancient stringed instrument, plucked by the fingers, similar to the guitar, mandolin, etc. L. has a pear-shaped body with neck attached to it; strings of catgut, but after XVII. cent. silver-spun bass strings were used. L. with large double-neck and two sets of tuning pegs was known as *Theorbo.* L. is of Oriental origin; in vogue between XV. and XVII. cent.

LUTETIA (PARISIORUM), ancient name of Paris (*q.v.*).

LUTHER, FLAVEL SWEETEN (1850), College President; *b.* in Brooklyn, Connecticut. Graduated from Trinity College in 1870. 1871 deacon Protestant Episcopal Church. 1867-81 professor of mathematics, Racine College. 1881-82 teacher in Ohio; 1882-83, Kenyon College, professor of mathematics. Since 1883, Seabury professor mathematics and astronomy, president 1904-19, Trinity College. 1907-11 member of Connecticut Senate.

LUTHER, MARTIN (1483-1546), leader of the Prot. Reformation in Germany; *b.* at Eisleben in Saxony; educated at a Franciscan seminary at Magdeburg, and later at Eisenach, passing in 1501 to the univ. of Erfurt; entered covent of Augustinian monks at Erfurt, 1505, where he fell into a state of profound melancholy; eventually found sense of pardon and forgiveness; ordained priest, 1507; appointed prof. at univ. of Wittenberg, 1508; at first lectured on dialectics and physics, then on the Holy Scriptures; visited Rome, and discovered the evils which lay under the so-called piety of the Church. On his return, attracted much attention by preaching and teaching, becoming superintendent of eleven Augustinian convents; condemned the sale of pardons and releases from purgatory authorized by Pope Leo X. and conducted by his emissary Tetzel, the Dominican monk, and publicly protested against the practice by nailing to the church door at Wittenberg his ninety-five theses 1517, which may be reckoned as the beginning of the Reformation. Luther was summoned to Rome, but the Pope sent legate to meet him at Augsburg. He refused to give a formal recantation; engaged in disputes with Eck, a Catholic controversialist, the result of which was a more accentuated opposition to Rome; pub. his famous treatises *An Address to the Nobility of the German Nation, On the Liberty of the Christian Man,* and *The Babylonian Captivity of the Church.* A papal bull against Luther was published in Germany, but he burned it along with the decretals which declared the Pope's supremacy. He was summoned to Diet of Worms, 1521; refused to retract anything; was condemned after formal close of the Diet; taken for safety by his friend the Elector of Saxony to the castle of Wartburg; wrote pamphlets and completed translation of N.T.; preached, traveled, published with unabated zeal. The reforming movement spread peacefully, but disorders sprang up among the noble who resented the oppression of the princes and the hierarchy, and also among the peasants, who had given a ready ear to Luther's assertion of the equal freedom and value of all men in God's sight. Luther condemned all excesses, sometimes in violent language and sought to vindicate the law on the one hand and condemn tyranny on the other.

A period of controversy followed. He sent a sharp reply to Henry VIII. of England on the seven sacraments; differed from Erasmus, and attacked him violently when the latter assailed his position that all human action is determined by Divine necessity; and quarreled with Zwingli on the sacramental question. There are few incidents of importance in Luther's life after the drawing up of the Augsburg Confession, the high-water mark of the German Reformation. He wrote much both in German and Latin; *Table Talk, Letters, Sermons* are best known.

according to tradition, flourished in IX. cent.; was son of royal house; sometime regent for nephew; said to have traveled, and on returning, introduced reforms in constitution which raised Sparta from condition of anarchy to strong united state; also credited with important military and educational reforms.

LYDDITE, a modern military high explosive, manufactured at Lydd in Kent, Eng. Chemically it is picric acid ($C_6H_2(NO_2)_3OH$), and is prepared from carbolic acid by the action of nitric acid. It is a bright yellow solid crystalline, and bitter to the taste. Like cordite, it is difficult to detonate. It is poured into shells when molten, and on bursting gives pungent, suffocating fumes.

LYDGATE, JOHN (*c.* 1370-*c.* 1451), Eng. poet of Chaucerian school; chief works are the *Storie of Thebes*, drawn from Statius and Boccaccio, the *Troy Book*, *Temple of Glass*, *Fall of Princes*. Versification is bad; poems are an example of XV.-cent. vain attempts to follow Chaucer.

LYDIA, ancient region, Asia Minor; bounded N. by Mysia, E. by Phrygia, S. by Caria, W. by Ionia; surface generally consists of two fertile plains separated by the Tmolus Mountains; plains produced cereals, and gold was mined in the hills, while the inhabitants manufactured textiles and carried on considerable trade. L. was a powerful kingdom under Gyges in early VII. cent. B.C., and reached its apogee under one of his successors, Croesus, whose name has become a synonym for wealth; Croesus was defeated and killed by Cyrus in 546 B.C., when L. became Persian province; it subsequently belonged to Athenians, Macedonians, and Romans in turn.

LYE. Caustic L's. are solutions of potash and soda; mild L's., of their carbonates. Mother L. is the fluid remaining after crystallization from solution.

LYELL, SIR CHARLES (1797-1875), Brit. geologist; *b.* Forfar; *s.* of Chas. Lyell, noted botanist. In his early days L. had a leaning to natural history; entered Exeter Coll., Oxford; B.A., 1819; M.A., 1821; called to Bar, 1825; commenced to study geol. as hobby; specialized in marine remains, Tertiary Period; pub. greatest work, *Principles of Geology* (3 vol's), 1830-33; became strong upholder of Darwin's theories; buried at Westminster; sometimes called 'father of modern geology.'

LYLE, EUGENE P., JR. (1873), Author. *b.* at Dallas, Texas. 1879 removed to Kansas City. Educated Kansas City public schools, 1880-92 and attended University of Michigan, 1892-94. 1894-97 on editorial staff of Kansas City paper. 1897-1900, 1903-5, 1906-7 did literary work in Mexico. 1900-2 staff correspondent for magazine in Europe, 1905-7 staff correspondent for magazine, and also from 1908-10. 1907-16 did farming in Virginia. Author of: *The Missourian*, 1905; *The Lone Star*, 1907; *Blaze Derringer*, 1910; *The Transformation of Krag*, 1911; *D'Artagnan of Kansas*, 1912-1914 in magazines; *A Dash of Irish*, (with W. F. McCalet) also in magazine, 1913; *The War of 1938*, 1918. *Day Before Yesterday's Child*, 1922. Since 1911 writing short stories.

LYLY, JOHN, LILLY, LYLIE (1553-1606), Eng. writer; *b.* Kent, Eng. ed. Oxford. L. is famous as inventor of Euphuism a flowery, aureate, stilted prose diction receiving its name from his novels *Euphues, the Anatomy of Wit*, 1579, and *Euphues and his England*, 1580.

L.'s plays are important more for their fine lyrics and brilliant wit than for their stories; best known are *Endymion*, *Midas*, *Love's Metamorphosis*. He wrote for the court and his plays are related to the Masque. He undoubtedly had much influence on Shakespeare (*cf. As You Like It*, the dialogue of Beatrice and Benedick in *Much Ado*).

LYME REGIS (50° 43′ N., 2° 56′ W.), seaport, watering-place, Dorsetshire, England, on English Channel; stone quarries; landing place of Monmouth in 1685. Pop. 3,000.

LYMPH, a colorless, watery fluid, alkaline, but less so than blood plasma, and coagulable, but clotting less firmly than blood plasma; it contains white corpuscles, lymphocytes, which are derived mainly from the lymph glands, and after digestion fat globules and dissolved substances from the digested food are present in the l. coming from the intestines, giving it a milky appearance. It exudes from the blood in the various tissues and organs, and after laving and nourishing the tissue cells it is taken up by the lymphatic vessels, carrying with it any waste products of the tissues, and eventually is poured into the great veins of the neck by the *thoracic* and *right lymphatic ducts*, the two main lymphatic vessels.

LYMPHATIC SYSTEM includes the *lymph capillaries* which lie in the intercellular spaces of the tissues, and receive the lymph after it has exuded from the blood capillaries and laved the tissue cells; these capillaries join together to form the *lymphatic vessels*, which are furnished with valves, and have an inner

lining of endothelial cells, an outer coat of fibrous tissue, and, in the larger vessels, a middle coat of muscular tissue. The *lacteals* are those lymphatic vessels which convey the *chyle*, or digested food, from the intestine, and they converge to join the sac termed the *receptaculum chyli*, to which go also all the abdominal lymphatics. From the receptaculum chyli goes the largest lymphatic vessel, the *thoracic duct*, which runs up close to the aorta, and on its right side, is joined by the lymphatics of the left side of the neck and the left arm, and opens into the commencement of the left innominate vein. The *right lymphatic duct* is a short vessel which is joined by the lymphatics of the right side of the neck and thorax and the right arm, and opens into the right innominate vein. There are certain *lymph spaces* in communication with the lymph capillaries, some of them being merely spaces in the connective tissue with no special lining; others, such as the capsule of Tenon in the orbit, or the sub-epicranial space in the scalp, lined with endothelium; others, larger and more important serous cavities, such as the pleural and the peritoneal cavities. The *lymphatic glands* have fibrous capsules from which fibrous bands go into the substance of the gland, which is composed of lymphoid tissue; the glands are situated in different positions in the courses of the lymphatic vessels, and act as filters, while from their cells are to a large extent derived the white corpuscles of the lymph and of the blood.

LYNCHBURG, a city of Virginia, in Campbell co. It is on the Norfolk and Western, the Southern, and the Chesapeake and Ohio railroads, and on the James River. Power is furnished by the river for the industries of the city which include foundry and rolling mills, tobacco factories, plants for the manufacture of farming implements, furniture, etc. The city is chiefly notable for its tobacco interests. It is the seat of Randolph-Macon Women's College, Virginia Christian College and several other institutions. In the neighborhood are great fields of coal, granite and iron ore. Pop. 1920, 29,956.

LYNCH LAW, punishment in America without observance of legal forms. Origin of term is not certain; theories are —(1) That it is named after Charles Lynch, J.P., of Virginia, said to have dealt out irregular justice; (2) derived from Lynches' Creek, South Carolina, rendezvous of 'regulators,' (*i.e.*) self-constituted police of mid-XVIII. cent.

LYNDE, FRANCIS (1856), Author; b. in Lewiston, New York. Educated in Academies. Until 1893 in railway service; since 1893 in literary work. Author of: *A Question of Courage*, *A Romance in Transit*, *A Case in Equity*, 1898; *The Helpers*, 1899; *A Private Chivalry*, 1900; *The Master of Appleby*, 1902; *The Grafters*, 1904; *Fool for Love*, 1905; *The Quickening*, 1906; *Empire Builders*, 1907; *The King of Arcadia*, 1909; *The Taming of Red Butte Western*, 1910; *The Price*, 1911; *Scientific Sprague*, 1912; *The Honorable Senator Sage-Brush*, 1913; *The City of Numbered Days*, 1914; *The Real Man*, 1915; *After the Manner of Men*, 1916; *Stranded in Arcady*, 1917; *Branded*, 1918; *David Vallory*, 1919; *The Wreckers*, 1920; *The Fire Bringers*, 1921; *The Donovan Chance*, 1921.

LYNDHURST, JOHN SINGLETON COPLEY, BARON (1772-1863), Lord Chancellor of England; Solicitor-General, 1819-24; one of counsel at trial of Queen Caroline; Attorney-General 1824-6; Master of Rolls, 1826-27; Lord Chancellor, 1827, 1834, 1841-46 (under Tory governments); noted for probity, ability, and polish.

LYNN, a city of Massachusetts, in Essex co. It is on the Boston and Maine and the Boston Revere Beach railroads, and on Massachusetts Bay. The city contains several villages. The chief industry is the manufacture of shoes, in which it ranks first in the world. There are also plants for the making of machinery, foundry products and patent medicines. There are public libraries and other public buildings. Pop. 1920, 99,148.

LYNX, see under CAT FAMILY.

LYON, MARY (1797-1849), an Amer. educator, *b.* in Buckland, Mass. For many years she was a teacher in private schools, and in 1837 she founded the Mount Holyoke Female Seminary, of which she was president for twelve years, thus laying the foundations of the present Mount Holyoke College, and being a pioneer of women's education in this country.

LYONS, or **LYON**, third city of France (45° 45′ N., 4° 49′ E.), at confluence of Rhone and Saone; episc. see; great commercial and industrial town—center of silk trade; first-class fortress; overlooked by two hills—Fourvières (*Forum Vetus*), crowned by sumptuous modern church, and Croix-Rousse, covered with silk-workers' houses; many fine bridges and quays. Other notable features are Roman remains (aqueducts, etc.); mediæval churches, especially cathedral of St. Jean, begun *c.* 1110, Eglise d'Ainay, rebuilt 10th-11th cent., St. Nizier, with ancient crypt; 17th cent. Hotel de Ville,

Palais des Arts, Bourse, unique Musée des Tissus; Palais de Justice, Préfecture; univ.; Hotel-Dieu and Hospice de la Charité, first of their kind in France; beautiful Parc de la Tête d'Or, Place Bellecour, Rue de la République. Lyons (*Lugdunum*) was the chief town of anc. Gaul, and was a great ecclesiastical and commercial center in Middle Ages; annexed to France, 13th cent.; long a hotbed of religious, political, and industrial unrest; Carnot assassinated here, 1894; birthplace of Germanicus, Claudius, Caracalla, Ampère, Puvis de Chavannes, etc.; silk fabrics, chemicals; printing, engineering, motor cars, etc.-great banking center (*Credit Lyonnais*). Pop. 523,800.

LYONS, COUNCILS OF. First Council, 1245, met to consider quarrel between pope and Emperor Frederick II.; resulted in excommunication and deposition of emperor. Second Council, 1274, passed regulations governing election of popes.

LYRE, an ancient Gk. stringed musical instrument of various patterns and sizes. The strings, at different periods numbering 4, 7, or 10, were stretched across a hollow body or sound chest, and played with a plectrum. The modern Gk. lyra is of the violin type, played with a bow; and several bowed instruments of this kind, differing greatly as to number of strings, were known as l's about the XIX. cent. Haydn alone among the classical composers wrote for the lyra.

LYRE-BIRDS (*Menura*), a genus of 3 large birds characterized by the peculiar lyre shape of the tail in the males. They form by themselves a family and order (*Menuriformes*) of birds. Lyre-birds live in the thick bush country of south-eastern Australia, where they feed upon insects.

LYRICAL POETRY, a species of verse originally accompanied by a lyre; in Gk. it is represented by such names as Sappho, Alcæus, and Minnermus, and in Lat. by Catullus and Horace. A lyric is normally personal, passionate, brief, and usually commences abruptly, and has no fixed form or metre; sonnets are often lyrics. In English the great lyrical outbursts were those of the Elizabethan dramatists, the Caroline poets, and the song writers of the XIX.-cent. romanticists.

LYS, riv., France and Belgium, rises in dep. Pas-de-Calais, and flows N.E. through Nord, past Armentieres, Menin, and Courtrai, forming the boundary between France and Belgium. It then continues through W. and E. Flanders, and after a course of 120 m. falls into the Scheldt at Ghent (51° 3′ N., 3° 42′ E.). For four years during the World War the Allied front ran from S.W. to E. of Armentieres, crossing the Lys in the neighborhood of Frelinghien, and linking up with the Ypres salient. This sector, especially in the neighborhood of Ploegsteert Wood and Bois Grenier, was the scene of constant trench skirmishes and of major operations by the Germans in their attempt to break through to the coast during the battle of Ypres-Armentieres, Oct.-Nov. 1914. In April 1918 they launched a great offensive between La Bassée and Armentieres, to which the name of the *Battle of the Lys* has been given. On April 9 they broke through that part of the front about Neuve Chapelle held by Port. troops, and within a few hours advanced to the Lys at Sailly and Bac St. Maur. On the following day they were in Armentieres and the battle extended northwards to the Messines and Kemmel ridges. After a fortnight's fighting the enemy failed to break through, and the battle gradually died away. See also WORLD WAR.

LYSANDER (*d.* 395 B. C.), Spartan general; ended Peloponnesian War after defeating Athenian fleet at *Aegospotami*, by capture of Athens, 405; slain in attack on Thebes; despotic and wily.

LYSIAS (*c.* 380 B.C.), Attic orator; s of Cephalus, wealthy Syracusan, friend of Socrates; went to Thurii from Athens when fifteen; was driven out after failure of Athenian expedition against Syracuse, 413; settled in Athens a shield-manufacturer; narrowly escaped death at the hands of the Thirty, 404; fled from Athens with loss of property, returned, 403; lived by writing speeches for litigants.

LYSIMACHUS (*c.* 355-281 B.C.), king of Thrace; on partition of realm of Alexander the Great, 323, received Thrace; helped to defeat Antigonus, 301; conquered Macedonia; slain by Seleucus at battle of *Cyropedion*.

LYSOL, a disinfectant containing the higher phenols, prepared from a portion of the middle-oil fraction obtained in the distillation of coal-tar. When the liquid portion of the creosote oil fraction is redistilled, naphthalene passes over and the residue, which forms about 60% of the total, is an oily fluid containing approximately 30% phenols. By boiling this mixture with alkali, the disinfectant is obtained. Lysol consists of a mixture of alkali compounds of the higher phenols with fat and resin soaps. As sold, it is a brown, oily liquid, having an odor of creosote, and a specific gravity of 1.04. It is poisonous, but less so than carbolic acid. It dissolves or mixes readily in

water, alcohol, ether, chloroform and benzol, and for washing wounds or similar antiseptic purposes it is always used in a highly diluted form.

LYTTELTON (43° 39′ S., 172° 32′ E.), seaport town, on inlet of Port Lyttelton, South Island, New Zealand; fine artificial harbor; extensive export trade.

LYTTON, EDWARD GEORGE EARLE LYTTON BULWER, 1ST BARON (1803-73), Eng. writer; youngest son of General Bulwer; played prominent part in society; early writings in verse; *Pelham*, 1828, established his popularity as novelist; series of brilliant novels followed, including *Eugene Aram*, *Paul Clifford*, and *Godolphin*; in *The Last Days of Pompeii* and *Rienzi* he showed an unsuspected power of sustaining human interest in archæological and historical fiction; his three chief plays, *Lady of Lyons*, *Richelieu*, *Money*, had unprecedented success; command over motive of terror shown in short story, *The Haunted and the Haunters*. Prominent Liberal politician as well as writer; secretary of state for colonies, 1858-9; cr. baron, 1866.

LYTTON, EDWARD ROBERT BULWER, 1ST EARL (1831-91), Eng. poet and statesman; son of 1st Baron Lytton; literary pseudonym, 'Owen Meredith'; minor poet of considerable merit; held various posts as ambassador; viceroy and gov.-gen. of India, 1878-80; started system of 'famine insurance'; satisfactorily conducted Afghan War, 1878-9, and pressed for annexation of Kandahar; introduced reforms in taxation and administration, severely criticized at time; cr. earl, 1880.

M

M, 13th letter of alphabet; originally picture of an owl; has affinity for letter *b*, hence numerous words in *mb.*, (*e.g.*) climb, dumb.

MAARTENS, MAARTEN (1858-1915), pseudonym of Joost M. W. Schwartz, Dutch novelist; produced a series of studies on Dutch life (written in English), which are distinguished by a fine power of analysis. Among his works are *The Sin of Joost Avelingh, God's Fool* (usually considered his best), *The New Religion, Brothers All,* and *Eve.*

MAASIN (10° 15′ N., 125° E.), town, S. coast of Levte, Philippine Islands. Pop. 18,000.

MAASTRICHT, MAESTRICHT (50° 51′ N., 5° 42′ E.), town, Netherlands, on Maas; capital of province Limburg; ancient *Trajectum Superius*; taken by the French in 1673, 1748, and 1794; chief objects of interest are ancient Church of St. Servatius; manufactures earthenware, glass, carpets. Pop. 40,000.

MABIE, HAMILTON WRIGHT (1846-1916), an American writer; *b.* in Cold Springs, N. J. He graduated from Williams College, in 1867, and from Columbia University Law School, in 1869. For a while he was on the staff of the Christian Union (now The Outlook), later becoming editor. He wrote *Norse Stories Re-told from the Eddas,* 1882; *Under the Trees and Elsewhere,* 1891; *My Study Fire,* 1894; *Backgrounds of Literature,* 1903; *Fairy Tales Every Child Should Know,* 1905; *Christmas To-Day,* 1908, and *Japan To-Day and To-Morrow,* 1914.

M'CABE, JOSEPH (1867), author and lecturer; ordained priest in R. C. Church, 1890; left church in 1896, and became private secretary, lecturer, journalist, and author. Among his publications are *Twelve Years in a Monastery,* 1897; *St. Augustine and his Age,* 1902; *The Decay of the Church of Rome,* 1909; *The Soul of Europe,* 1915. Among his translations is Haeckel's *Riddle of the Universe.*

MACABEBE (15° N., 120° 40′ E.), town; Luzon, Philippine Islands. Pop. 15,000.

MACABRE, a species of composition where death and its accompaniments are treated with eerie humor. In English, John Webster and E. A. Poe are outstanding writers of this class. The origin of Macabre seems to be the mediæval representations of the *Dance of Death.*

MACADAM, JOHN LOUDON (1756-1836), Scot. inventor of 'macadamized roads,' (*i.e.*) roads covered with crushed metal.

McADOO, WILLIAM GIBBS (1863), American lawyer and cabinet officer; *b.* Marietta, Ga. He received his education at the University of Tennessee and was admitted to the bar in 1885. He began the practice of law in Chattanooga, Tenn., and in 1892 removed to New York City. Here, while continuing his law practice, he became interested in the plan of tunneling under the Hudson, and in 1902, with the assistance of financiers whose confidence he had gained, organized and headed the New York and New Jersey Railroad Company, which carried the tunnel scheme to a successful conclusion. He engaged in politics, was vice chairman of the Democratic National Committee in 1912, and in 1913 accepted the position offered by President Wilson of Secretary of the Treasury. His tenure of office was marked by the enormous transactions made necessary by the entrance of the United States into the World War, and in this work Mr. McAdoo showed a versatility and efficiency that won the encomiums of the whole country regardless of party. Equal ability was displayed by him when to his other duties were added those of Director General of Railways. He resigned as Secretary of the Treasury in 1918 and relinquished the Director Generalship in 1919. He married as his second wife, in 1914, Miss Eleanor Wilson, daughter of the President. He was prominently mentioned in 1920 as a nominee for the Presidency.

McALESTER, city and county seat

of Pittsburg County, Oklahoma. It is located on the Chicago, Rock Island and Pacific and the Missouri, Kansas and Texas Railroads. It has extensive stock-raising interests and is the center of the vast coal field section of eastern Oklahoma. The city has also great wholesale and jobbing interests that extend not only through Oklahoma but reach out into northern Texas and western Arkansas. It has good educational facilities which include seven public schools, a high school and two business colleges. There are numerous churches, six banks, and four daily and weekly newspapers. The Oklahoma State Penitentiary is located in the vicinity. The city manager form of government has been adopted. Pop. 12,095.

MacALESTER COLLEGE, a co-educational institution founded in Macalester Park, St. Paul, Minn., in 1884, under the auspices of the Presbyterian Church. It has an academy, a collegiate department and a department of music. In 1921-22 it had a faculty of 28 and a student body of 400.

MACAO (22° 11′ N.; 113° 30′ E.), Portug. settlement and city, on island of Hang-Shang, at mouth of Canton River, China; formerly an important seat of commerce; bp.'s see; chief export, tea; settled by Portug. in 1557. Pop. 75,000.

MACARONI, an Ital. foodstuff prepared from hard wheat, worked into a thick paste with water and moulded in various forms.

MACARSCA (43° 18′ N.; 17° 1′ E.), seaport, Dalmatia, Jugo-Slavia, on Adriatic; wine. Pop. 15,000.

MacARTHUR, ARTHUR (1845-1912), an American soldier; *b.* in Springfield, Mass. He served during the beginning of the Civil War as a private in a Wisconsin regiment, but at the end of the war was a colonel of volunteers. He was transferred to the regular Army with the rank of lieutenant. During the Spanish-American War he went to the Philippines as a brigadier-general, being raised to the rank of a major-general in 1901 and becoming lieutenant-general in 1906. He was retired in 1909.

Mac ARTHUR, DOUGLAS (1880), army officer; *b.* in Arkansas. Graduate of United States Military Academy, 1903; Engineer School of Application, 1908; 1903 commissioned 2nd lieutenant engineers, 1st lieutenant, 1904; captain, 1911; major, 1915; colonel infantry, 1917, National Army. 1918, brigadier-general (temporary); 1920, brigadier-general regular army; 1903-1904, in Philippines; 1905, with California Debris Commission; 1905, acting chief engineer officer Pacific Division; 1905-1906, duty in Japan; 1906-1907, aide-de-camp to President of United States; 1917, appointed chief of staff 42nd Division; commander, 1918. 1919, appointed superintendent United States Military Academy. Was decorated by American, French, Italian and Belgian Governments.

Mac ARTHUR, ROBERT STUART (1841-1923), clergyman; *b.* in Canada. Holds degrees from various colleges. Pastor of various churches, including Calvary Church, New York. Author of *The Attractive Christ and Other Sermons*, *Divine Balustrades*, *Calvary Pulpit*, 1898; *Current Questions for Thinking Men*, *Quick Truths in Quaint Texts*, 1898; *On Bible Difficulties*, 1898; *Celestial Lamp*, *Lectures on the Land and the Book*, 1899; *Calvary Hymnals*, *Laudes Domini*, *Calvary Selection for Social Worship*, 1899; *The Christic Reign*, 1908; *Royal Messages of Cheer and Comfort*, 1909; *The True Scala Santa*, 1910; *Famous Johns of Christendom*, 1915; *The Question of the Centuries—What Think Ye of Christ?* 1921.

MACASSAR (5° 8′ S., 119° 21′ E.), seaport town, Celebes, Dutch East Indies; flourishing trade; exports coffee, spices, oil, timber. Pop. 18,500.

MACAULAY, THOMAS BABINGTON, BARON MACAULAY OF ROTHLEY (1800-59), Eng. historian and statesman; *b.* Rothley Temple, Leicestershire; *s.* of Zachary M., Whig and leader of slavery abolitionists; *m.* a Quaker; noted as precocious child; retained wonderful memory through life; twice won Chancellor's medal for poems at Cambridge; called to Bar, 1826; commenced connection with *Edinburgh Review*, 1825; sec. to Board of Control, 1832; legal adviser to Supreme Council in India, 1834-38; P.C., 1839; Sec. of War, 1839-41; *Lays of Ancient Rome* appeared, 1842; *Essays*, 1843; member of cabinet as paymaster-general of forces, 1846-48; after which he retired from active political life and devoted himself to compilation of well-known *History of England from the Accession of James II.*, never completed. The sale of M.'s writings was unique in annals of hist. lit. He had great power of giving personality to hist. characters.

MACAW, see under PARROT TRIBE.

MACBETH, King of Scotland, the date of whose birth is unknown, was the *s.* of Findlaech, and hereditary ruler of Moray and Ross. In 1040 he murdered Duncan, the successor of Malcolm, and became king of Scotland, basing his claim to the throne through his wife

Gruach. According to St. Berchan, his reign was prosperous, and M. a benefactor; he made a pilgrimage to Rome in 1050. In 1054 he was defeated by Siward at Dunsinane (Perthshire), and in 1057 defeated and slain by Siward and Malcolm, the *s.* of Duncan, at Lumphanan in Aberdeenshire. Shakespeare's tragedy of *Macbeth* is based on his life.

M'BURNEY, CHARLES (1845-1913), an American surgeon; *b.* in Roxbury, Mass. He graduated from Harvard University in 1866, and from Columbia University Medical School in 1870, then began to practice surgery in New York City. Subsequently he became professor of surgery in the College of Physicians and Surgeons. He achieved a nation-wide fame as a skillful surgeon, being the discoverer of the McBurney Point, which is pothognomanic of appendicitis. As an authority on appendicitis he ranked first in the country. He was the attending surgeon when President McKinley was assassinated

MACCABEES, Jewish family, who led patriotic revolt against Antiochus Epiphanes and his successors. Chief member, Judas (*d.* 160 B. C.), *s.* of the priest Mattathias, who slew an apostate Jew. Followers of Judas called themselves *Maccabeans.* He won great victories over Apollonius near Samaria, over Seron at *Bethoron,* and over Ptolemy, Nicanor, and Gorgias; entered Jerusalem, purified temple and restored religion, 164. His *bro.* Jonathan, high priest, continued contest, expelling Syrians from Palestine, till death, 144. Remaining *bro.* Simon, also high priest, with aid of his sons and Roman alliance, freed Judæa from Syria.

MACCABEES, BOOKS OF.—I. *Maccabees* contains Jewish history, 175-135 B.C. (*i.e.*) from the reign of Antiochus Epiphanes to death of Simon, main source for this period—the life and death struggle of Jewish nationalism against Hellenizing tendencies; dates probably from 100-80 B.C. (possibly earlier), and is the work of a Palestinian Jew; original language Hebrew or Aramaic. II. *Maccabees* gives history from 176-161 B.C., thus covering some of the ground of I. *Maccabees,* but with additional matter. It is fuller of the supernatural and generally less hist. and more didactic; written probably I. cent. B. C. The name M. is also given to other apocryphal books not in our regular Apocrypha. *III. Maccabees,* an hist. remains of Jewish persecution dealing with III. cent. B. C., written I. cent. B. C. or 1. A. D. *IV. Maccabees,* religious work of no hist. value, written about time of Christ. *V. Maccabees,* an Arabic compilation.

MACCABEES, THE, a secret benefit and fraternal organization formed by the merging of Knights of the Maccabees of the World and Knights of the Modern Maccabees. The former organization was founded in the city of London, Canada, in 1878 and rapidly established local lodges or 'tents' in many parts of Canada and the United States. The merger with the Knights of the Modern Maccabees took place in 1914. The name of the association is derived from the Maccabees described in the Apocryphal books of the Old Testament and has special reference to the law laid down by Judas Maccabeus that part of the spoils of victory should be devoted to the widows and orphans of those who had fallen in battle. This was analogous to the work of the modern Maccabees organization, which aims to unite in a fraternal benefit association white male persons of sound health and good moral standing between the ages of 18 and 70, to provide for them sick and disability benefits and also to furnish funds for their families in case of death. Apart from these material benefits, the organization provides social and fraternal intercourse for its members. It has a representative form of government and a ritualistic ceremony. General meetings of the governing body (the Supreme Tent) are held once in three years, at which delegates from various tents are present. In the interval between meetings a board of seven trustees administers the affairs of the organization. The assets of the association, which are more than $20,000,000, are conservatively invested, money being placed in nothing else than Government, State and municipal bonds. The membership of the order in 1923 was 275,000. There is a woman's auxiliary of the organization, officered and managed solely by women, that in the main has similar aims and methods of administration to those of the main order. It has 3,000 local bodies with over 200,000 members.

M'CALL, SAMUEL WALKER (1851-1923); governor; *b.* at East Providence, Pa. Graduated from Dartmouth, 1874. Admitted to Massachusetts Bar and practiced at Boston. Editor-in-chief of Boston paper. Member Massachusetts House of Representatives, 1888, 1889, 1892. Member of Congress, 1893-1913, 8th Massachusetts District. Member fourteen years, Ways and Means Committee. Governor of Massachusetts, 1916-1918. Author *Dartmouth Centennial Address on Daniel Webster,* 1901; *Life of Thaddeus Stevens* (American Statesmen Series), 1899; *The Business of Congress* (The Blumenthal Lectures, Columbia University), 1911; *Life of Thomas B. Reed* (American Statesmen Series), 1914.

M'CARTHY, JUSTIN (1830-1912), Irish novelist and journalist; chief work, *A History of Our Own Times.*

M'CARTHY, JUSTIN HUNTLY (1860), historian, novelist, dramatist, son of Justin McCarthy; has traveled extensively in Europe, Palestine, and U. S. A.; his historical works include *A History of England Under Gladstone* and *Sketches of Irish History*; his novels include *Dolly* and *The Dryad.* He has also written in verse, trans. the *Rubaiyat* of Omar Khayyam, and is the author of many plays.

MACCHIAVELLI, see MACHIAVELLI.

M'CLELLAN, GEORGE BRINTON (1826-1885), American soldier; *b.* Philadelphia, Pa. He was educated at the University of Pennsylvania and at West Point, from which latter institution he graduated in 1846. He rendered valuable service in the Mexican War, and was brevetted captain for gallantry at Chapultepec. For several years following he was engaged in army engineering work, and in 1857 resigned from the army to become vice president and engineer of the Illinois Central Railroad. When the Civil War broke out, he was made major-general and commander of the Department of the Ohio. He cleared West Virginia of Confederate troops, and on the 22nd of July, 1861, was made commander of the Army of the Potomac, with which henceforth all his war service was identified. Later, on the retirement of General Scott, he was made commander-in-chief of the armies of the United States. His ability as an organizer was shown in the rapid recovery of the army from the demoralization that followed the defeat of Bull Run. He was too slow and deliberate, however, in his movements, and popular discontent caused him to be deprived of the chief command in March, 1862, leaving to him only the army of the Potomac. His advance toward Richmond was marked by some successes, but here again his excessive caution led to a retreat which ended only when the Federal forces reached Hampton's Ferry. He was again relieved of his command and placed in charge of the fortifications of Washington, but later succeeded Pope as leader of the Army of the Potomac and won the battle of Antietam, only again to lose the fruits of victory by failing to press the retreating enemy. This failure caused him to be deprived of his command, and he took no further part in the war. In 1864 he was the Democratic nominee for President, but was defeated by 212 electoral votes to 21. He was chosen governor of New Jersey in 1877. As a general, McClellan was a superb organizer and excellent tactician; but he lacked the dash, celerity and aggressiveness of a great commander, and failed to take instant advantage of the mistakes of the enemy. In addition to many military reports, he was the author of *Manual of Bayonet Tactics*, 1852; and *Report on the Organization and Campaigns of the Army of the Potomac*, 1864.

M'CLELLAN, GEORGE BRINTON, (1865), an ex-mayor of New York City, the *s.* of General McClellan; *b.* in Saxony, Germany, while his parents were on a visit there. He graduated from Princeton University, in 1886, was a reporter on New York papers for some years, studied law and began to practice; was a member of the Board of Aldermen of New York City in 1893, and was elected to Congress for the terms covering 1895-1903. He served as Democratic Mayor of New York City from 1903 until 1909. From 1912 he was professor of economic history at Princeton University.

M'CLERNAND, JOHN ALEXANDER (1812-1900), an American soldier; *b.* in Breckinridge County, Ky. He was admitted to the bar in 1832, was elected to the state legislature and served two terms in Congress. As a soldier in the Federal Army during the Civil War he quickly rose to the rank of brigadier-general and, before the close of the war, major-general. He commanded a division at Shiloh, and in 1863 relieved Sherman at the siege of Vicksburg. After the war he took up law again and in 1870 was appointed a judge of the Federal Circuit Court, in an Illinois district.

MACCLESFIELD (53° 16′ N., 2° 8′ W.), market town, Cheshire, England; chief buildings are old church of St. Michael and town hall; silk manufactures; stone and slate quarries in vicinity. Pop. 1921, 33,846.

MACCLESFIELD, CHARLES GERARD, 1ST EARL OF (*c.* 1618-94), commander-in-chief for Charles I. in South Wales, 1644, and made royal cause supreme; intrigued with Monmouth, and was forced to fly country on accession of James II.; returned at head of bodyguard of Prince of Orange, 1688.

M'CLINTOCK, SIR FRANCIS LEOPOLD (1819-1907), Brit. sailor and Arctic explorer; discovered traces of Franklin, 1850; relieved McClure, 1852; found record of Franklin's death, 1857.

M'CLINTOCK, JOHN (1814-70), Methodist divine; prof. at Pennsylvania

University; worked in New York, Paris, and London; did much for education

M'CLOSKEY, JOHN (1810-1885), an American prelate of the Roman Catholic Church; *b.* in Brooklyn, N. Y. He acquired his first training for the priesthood at St. Mary's College, in Emmitsburg, Md., continuing his studies in France and Rome. Returning home he was ordained a priest, in 1834, and was assigned the pastorate of St. Joseph's Church in New York. He was the first president of St. John's University, at Fordham, now Fordham University. In 1842 he became Bishop of Albany, N. Y., Archbishop of New York in 1864, and in 1875 he was appointed a cardinal.

M'COMB, city of Pike co., Miss. 105 miles north of New Orleans on the Illinois Central and Liberty-White railroads. It is the market and shipping center for a rich cotton growing district and does an extensive trade also in corn, potatoes and sugar cane. Its chief industries are cotton mills, lumber mills and machine shops. The city has good churches, schools, two newspapers and a bank. Pop. 1920, 7,775.

M'COOK, modern American family known as 'the fighting McCooks.' Daniel (1798-1863), a major, served with his eight sons in Civil War; three of them were generals; nephew, Henry Christopher McC. (1837-1911), noted etymologist.

M'COOK, ALEXANDER M'DOWELL (1831-1903), an American soldier; *b.* in Columbiana County, Ohio. He graduated from the West Point Military Academy, in 1853. At the outbreak of the Civil War he took command of a regiment of Ohio volunteers and so distinguished himself that a year later he had risen to the rank of major-general. He participated in the two battles of Bull Run, Shiloh, Murfreesburg, Chickamauga and many minor engagements. In 1865 he was commissioned a brigadier-general of the regular U. S. Army, reaching the rank of major-general in 1894; shortly after which he was retired.

M'CORMACK, JOHN (1884), tenor singer; *b.* in Ireland. Educated Summer Hill College, Ireland. Studied voice culture in Milan. 1917 at Holy Cross College, honorary Doctor of Literature. At Dublin Musical Festival, 1904, won first prize. Studied two years in Italy and made debut in London in *Cavalleria Rusticana*; 1907, sang in *Rigoletto*; 1909, engaged with Manhattan Opera Company and later with Chicago Grand Opera Company, Monte Carlo Opera Company, Chicago-Philadelphia Opera Company. Principal roles, *Pinkerton* in *Butterfly*; *Rodolfo* in *La Boheme*, *Faust*, etc. Noted as concert singer. 1919, naturalized citizen of United States.

M'CORMICK, CYRUS HALL (1859), an American manufacturer, the *s.* of Cyrus Hall McCormick, the inventor of the reaping machine; *b.* in Washington, D. C. He graduated from Princeton University with the class of 1879 and immediately entered the employ of the McCormick Harvesting Machine Co., of which he became president after his father's death, in 1884. In 1902 that corporation was merged with the International Harvester Co., of which he became president. Since 1919 he has been chairman of the board of directors. In 1917 he went to Russia as a member of a special diplomatic mission for the U. S. Government.

McCORMICK, JOSEPH MEDILL (1877), United States Senator; *b.* in Chicago. 1900, Bachelor of Arts, Yale University. Was publisher of Chicago daily paper. Vice-chairman, 1912-1914, Progressive National Committee. Elected twice to Illinois General Assembly. Member of Congress, 1917-1919, Illinois at-large. United States Senator from Illinois for term 1919-1925.

McCORMICK, VANCE CRISWELL (1872), newspaper publisher; *b.* in Harrisburg, Pa. Graduated from Yale College in 1893. Publisher of a morning and evening newspaper at Harrisburg 1900-1902, member of City Council Harrisburg. 1902-1905, Mayor. 1914 Democratic candidate for governor of Pennsylvania. 1916, chairman of Democratic National Campaign. 1917-1919 chairman of War Trade Board. 1917, member of war mission to Great Britain and France. 1919, advisor to President, American Commission to Negotiate Peace, Paris. Director of Federal Reserve Bank. Member, Yale Corporation. Member of executive committee and trustee of Pennsylvania State College.

McCOSH, JAMES (1811-1894), a Scottish-American educator; *b.* in Ayrshire, Scotland. He acquired his education in the University of Glasgow and the University of Edinburgh, was a minister of the Church of Scotland until its disruption, when he joined the Free Church, in whose establishment he was one of the leaders. He was professor of logic and metaphysics at Queen's College, Belfast, for 18 years. In 1868 he was invited to become president of the College of New Jersey (later Princeton University). Accepting, he held

laria is rampant; of *c.* 162,000 cases in Brit. army, 1916-18, *c.* 700 proved fatal. Climate subject to extremes of cold in winter. Inhabitants include Turks, Slavs, Greeks, Bulgars, Jews, Albanians, Gipsies, Vlachs, and Circassians. Chief religions are Gr. Orthodox, Mohammedan, Jewish. In alluvial plains and better parts of highlands agriculture is carried on; crops include olives and cotton; rice in Struma valley; irrigation is practiced. Fishing is important. In anc. times area famed for gold and silver mines, and produced oil and wine. Chief products are grain, tobacco, opium, silk, rice, fruits. Chief railway follows Vardar R.; transport is mainly by pack animals.

After being controlled in turn by Athens, Thebes, and Sparta, Macedonia became a powerful kingdom under Philip II., and attained its zenith under Alexander the Great, *c.* 330 B. C. It was invaded by Gauls in 3rd cent. B. C.; conquered by Romans in 168 B. C., and became prov. of Rome; invaded by Goths in 4th cent. A. D., and overrun by Theodoric in 482; settled by hordes of Slavs between 3rd and 7th centuries; seized by Bulgars, 978; was under Byzantine control in 11th cent.; formed part of kingdom of Thessalonica in 1204, and was under sway of Serbia, 1330-55; taken by the Turks in 1430.

Turk. oppression of Christian inhabitants resulted in open rebellion in 1902 and 1903, and this was put down with terrible cruelty. In 1903 Austria and Russia intervened, suggesting various reforms, but without much result. Constant massacres took place, and the prov., owing partly to religious differences, partly to Turk. misrule and Bulgarian intrigue, long remained on verge of revolt. During the Balkan War, Macedonia formed the main Serbian objective, while a Bulgarian force invaded it from N. E. In the proposed partition of January, 1913, Serbia and Bulgaria claimed the greater part of Macedonia, but no real settlement was reached before outbreak of war in 1914. Macedonia is now largely merged with Greece. For Macedonia during the World War, see BULGARIA; SALONICA; SERBIA; and WORLD WAR. See MAP OF EUROPE.

MACEDONIAN EMPIRE.—Macedonians were Pelasgians of same stock as Greeks, Thracians, and Illyrians, and their kings claimed descent from Heracles; monarchy dates from about 700 B. C. Perdiccas I. and shadowy successors ruled, 700-498. Amyntas I. was succ. by *s.*, Alexander I., 489-54, who took part in Olympic Games of Greece; his *s.*, Perdiccas II., 436-13, made war against Athens, which was extending its territory northwards and had founded Amphipolis; Archelaus, 413-399, civilized his people, built up army, and established fortresses and military roads; civil strife ensued on his death until accession, 360, of Philip, who completed his work; he developed famous Macedonian phalanx, improving the form evolved by Epaminondas of Thebes, and established Macedonian supremacy over all surrounding states, including those of Greece; decisive battle of *Choeronea*, 338; his *s.*, Alexander the Great, 336-23, conquered Persian empire.

Alexander ruled at his death Macedonia and Thrace in Europe; Phrygia, Lydia, Caria, Lycia and Pamphylia, Great Phrygia, Paphlagonia, and Cappadocia in Asia Minor; Cilicia, Syria, Mesopotamia, Babylonia, Susiana, Persis, Media, Parthia, Hyrcania, Bactria, Arcia and Drangiana, Carmania, Sogdiana, Arachosia and Gedrosia, the Kabul valley and province on Indus in Asia; and Egypt. In conquered realms of Persia system of government by lieutenants called *satraps* was retained, though Macedonians were generally app. On Alexander's death the empire was partitioned; a series of murders exterminated royal family; Antipater, gov. of Macedonia, seized the crown of the kingdom, but his descendants were unable to retain it. It fell into hands of Demetrius, ruler of Thessaly, 294, was seized by Pyrrhus, king of Epirus, 287, and by Lysimachus, king of Thrace, 286.

Seleucus, ruler of Babylonia, displaced Lysimachus, 281, but was murdered by Ptolemy Ceraunos, 280. Ptolemy made himself master of Macedonia, but Babylonia was occupied by Antigonus, *s.* of Seleucus; Meleager, Ptolemy's *bro.*, Sosthenus, Ptolemy II., and Pyrrhus enjoyed brief and troubled rule, till finally power fell into hands of *s.* of Demetrius, Antigonus Gonatas, 276. He drove back Gauls, whose incursions had become serious danger, and made Macedonia again a strong kingdom, but Asia, separated finally, had definitely become eastern empire under Seleucids, and Egypt formed brilliant kingdom of Ptolemies.

Antigonids resumed old Macedonian position of chief Gk. power, but future history hung on relations with new imperial power, Rome. Philip III., 220-179, was forced to make treaty, after defeat by Romans at *Cynoscephalae*, 197, agreeing to confine his activity to Macedonia and make no war without permission of Rome; after battle of *Pydna*, 168, Macedonia was divided into four provinces with local autonomy, but dependent on Rome; revolt crushed by

Metellus at second battle of *Pydna*, 148, after which Macedonia was formed into Rom. province, 146, with Illyria; ultimately proconsul resided at Thessalonica. Macedonian Seleucid empire gradually broke up; ended with Rom. annexation of Syria, 64. Egypt was conquered by Rome, 30.

MACEIO (9° 40′ S., 35° 51′ W.), seaport town, capital, Alagoas, Brazil; exports cotton, rum, sugar. Pop. 33,000.

MACERATA (43° 18′ N., 13° 26′ E.), town, capital, Macerata, Italy; has univ. and cathedral; various industries. Pop. town, 23,000; province, 26,000.

MacGAHAN, JANUARIUS ALOYSIUS (1844-1878), American journalist; *b.* near New Lexington, Ohio; *d.* in Constantinople. During the Franco-Prussian war of 1870 he was with General Bourbaki as correspondent for the N. Y. Herald. He was the only American to remain in Paris throughout the Commune. In 1873, after many hardships, he joined the Russian army before Khiva and his reports from the front became famous. He was in Cuba for the Virginius affair and with the army of Don Carlos in Spain during the Carlist uprising. Captured by the Republicans he was condemned to death and only freed by the intervention of the American minister. In 1876 he was with the Turkish army for the London Daily News and his story of the atrocities on Bulgarians made a deep impression. During the Russo-Turkish war he contracted a fever while nursing a friend from which he died. In 1884 the Ohio Legislature had his body removed to New Lexington. Author, *Campaigning on the Oxus*, 1874; *Under the Northern Lights*, 1876, and *Turkish Atrocities in Bulgaria*.

McGEE, THOMAS D'ARCY (1825-68), Irish-Canadian politician and poet; emigrated, 1842, but returned and became associate of O'Connell in Young Ireland movement; edited *Amer. Celt*, 1850-57; retired to Montreal and became prominent member of Canadian Parliament; assassinated for denunciation of Fenians.

McGIFFERT, ARTHUR CUSHMAN (1861), American theologian and author; *b.* in Sanquoit, New York. He graduated from the Western Reserve University in 1882; Union Theological Seminary in 1885 and studied in Germany, France, and Italy. Instructor of Church History, Lane Theological Seminary, 1890; professor of same, 1890-1893, and since professor of Church History, Union Theological Seminary. His *History of Christianity in the Apostolic Age* brought such a storm of criticism that he left the Presbyterian Church and joined the Congregationalists, but retained his professorship. Author, *Dialogue Between a Christian and a Jew*, 1888; *The Apostles Creed*, 1902; *Protestant Thought Before Kant*, 1911; *Martin Luther*, 1911. He translated Eusebius' *Church History* 1890.

MacGILL, PATRICK (1890), Irish author; worked in his youth as a surface man, navy, etc.; joined army at outbreak of World War and was wounded at Loos 1915. Author of *Gleanings from a Navvy's Scrap-Book*, *Songs of a Navvy*, *Songs of the Dead End*, *The Amateur Army*, *The Red Horizon*, *Soldier* [*Songs*, *The Brown Brethren*, *Glenmornan*, etc.

McGILL UNIVERSITY, at Montreal, Canada; incorporated 1823 and named after the founder, Hon. James McGill, who donated land and $50,000. It was opened in 1829. The administration is in the hands of the governors, principal, and fellows who make up the corporation, supreme authority resting with the Crown, represented by the governor of Canada as visitor. The University includes McGill College, Royal Victoria College for Women, Montreal, MacDonald College, Ste. Anne de Bellevue, and other affiliated colleges outside the city. There are five faculties; art, applied science, law, medicine, agriculture; a graduate school, conservatory of music, and normal school. Citizens of Montreal and graduates gave $4,000,000, and the Rockefeller Foundation $1,000,000 to the University in 1921. Income about $1,000,000. Students, 2,665. In Extension Course, 971. Lecturers and teachers, 200.

MacGILLIVRAY, WILLIAM (1796-1852), Scot. naturalist; especially devoted to zool., and author of a classic *History of British Birds*. His *s.* John, also a naturalist, was author of the account of the *Voyage Round the World of H.M.S. Rattlesnake*.

McGLYNN, EDWARD (1837-1900), Roman Catholic priest; *b.* in New York; *d.* in Newburg, N. Y. He was educated at the Church of the Propoganda, Rome, and from 1866 was pastor of St. Stephens, New York City. He supported Henry George when he ran for mayor. Censured by the church he was called to Rome, but declined to go on the plea of ill-health. In 1887 he was ex-communicated by the Pope. Father McGlynn was founder and president of the Anti-Poverty Society. In 1893 he was accorded a hearing by Monsignor Satolli, the Papal delegate, and showed that his views were not in conflict with the church, after which the ban of ex-com-

munication was removed. He died pastor of St. Mary's Church, Newburg, N. Y.

McHENRY FORT. A former United States military post established in 1794 on Whetstone Point, Patapsco River, three miles from Baltimore, Md. On September 14, 1775, it was bombarded by a British fleet under Admiral Cockburn without results. The heroic defense of the fort inspired *The Star Spangled Banner.*

MACHETE, a tool or weapon half knife and half cleaver, used in Cuba and other tropical countries.

MACHIAVELLI, NICCOLO (1469-1527), Florentine statesman and author; *s.* of a lawyer; became clerk in chancery of Florentine republic, 1494; second chancellor and sec., 1498-1512; his political experience among the subtle, worldly people who then led civilization in Renaissance period, and the frequent opportunities afforded by foreign embassies, account for urbanity, cynicism, and wide knowledge of M's books. The Christian standard was entirely abandoned; hence *Machiavellianism* was synonymous in XVI. cent. with everything that was evil. Throughout his career, however, he showed himself a patriot; to impress on Florence the need for militia he wrote address to Gonfalonier Soderini, 1506, entitled *Discorso sulla provisione del danaro,* a scheme, subsequently adopted, for financing citizen army. He fell from office with return of Medici, 1512, when his reforms were undone and he was exiled; racked and imprisoned on suspicion of having conspired with Boscoli, 1513; released and wrote, in retirement at his country villa, works of political wisdom intended for his native city; *Il Principe,* finished 1513, and widely read in MS., was not pub. till after his death; his famous comedy, the *Mandragola,* was pub., 1524.

MACHINE GUN. The modern machine gun is a small-calibre firearm fitted with a mechanical automatic contrivance for continuous reloading and firing so as to secure a rapid fire, the cartridges being supplied from a belt or magazine. To distinguish the machine gun from the repeating rifle, it should be added that it is usually fired from a tripod or carriage, so as to keep it laid upon its target and secure continuously effective fire. From the earliest days of firearms attempts were made to produce machine guns, and the oldest types, known as *ribaudequins* or *orgues* (*i.e.,* 'organ guns') were groups of six to ten musket barrels, mounted on a frame, and fired either with separate locks or with a single lock firing a quick match that ignited the charges in succession. These guns were used, mostly in fortress warfare, in the 15th and 16th centuries. Modern inventors produced improved forms of the organ gun. Another variety, of this type, known as the 'Requa battery,' was used in the defense of Charleston in the Civil War.

The first really effective weapon was invented by Dr. Gatling of Chicago in 1862. It was a group of six barrels fixed on a central axis, and revolved by a small winch or crank handle. This actuated the reloading and firing gear, and the cartridges were fed from a magazine on top of the gun. Some of these guns were used in the American Civil War. In 1870 the French brought into the field an adaptation of the Belgian Montigny mitrailleuse (originally designed by Faschamps in 1851). It was an assemblage of twenty-five barrels, grouped in a cylindrical case and mounted like a field gun. It was loaded by dropping into a large slot at the breech a block perforated to hold twenty-five cartridges, each placed so as to lie in line with a corresponding barrel. On depressing a lever these could be fired either as a salvo or in rapid succession. The French used the gun mostly as if it were a field-piece, and the machine-gun batteries were easily knocked out by shell fire. Their failure led to military opinion being long after opposed to machine guns in any form. But the Gatling came into use for savage warfare, against the easy targets supplied by the rushes of ill-armed opponents. It was also introduced into many navies as a boat gun and a weapon for landing parties, and the Russian army took it up for fortress defense and Central Asian campaigns. It soon had a competitor in the Nordenfeldt gun, which in its various forms had either a single barrel or from two to four mounted on a frame, and with the mechanism actuated by a handle.

All machine guns had so far been hand-worked, but in 1883 Hiram Maxim took out patents for an automatic or self-acting gun. It utilized the recoil to actuate the breech mechanism, and could fire 600 rounds in one minute. Its essential points were use of the recoil, not only to actuate the mechanism, but also to store up in a spring the force for bringing it back to normal position; feed of cartridges by a moving belt; ejection of used cartridge and loading up of the next cartridge by a flanged rising and falling block, known as the 'ejector,' but also acting as the loader; use of a water-jacket round the barrel to delay overheating. Various modifications of

the Maxim system were afterwards introduced (*e.g.*, the Austrian 'Schwarzlose,' and the Ital. 'Perini'). Another automatic principle was subsequently introduced by other inventors—(*i.e.*,) the use of a valve to liberate some of the explosive gas from the barrel, before the bullet leaves the muzzle, this gas passing into a small cylinder and forcing back a piston linked by a rod with the breech action. This is the basis of the design in the Fr. Hotchkiss machine gun or mitrailleuse, the Colt gun, and the Lewis gun. The Lewis gun is supplied with cartridges from a flat revolving drum or magazine above the breech action, and has an ingenious air-cooling device. The light-pattern Hotchkiss and the Lewis can also be fired from the shoulder, and thus fall into the class of heavy repeating rifles.

The most efficient and simple machine gun perfected during the World War was the Browning. The American army was equipped with these, but too late for actual use. See BROWNING MACHINE GUN.

MACHINES.—The parts of a machine are of two kinds: (*a*) fixed parts, or frame; (*b*) moving parts, or mechanism.

The design of the frame depends on the size and formation of the moving parts or mechanism. In a machine, energy is communicated to the moving parts by prime movers, or mechanism, and thence to the working parts. For the purposes of scientific design, the usual method is to consider first the force and the variation of force required; to proceed then to a solution of the motion to be given by the machinery; and, lastly, to design the machine for that particular motion.

All varieties of machinery are based upon the three simple mechanical powers: (1) the lever; (2) the pulley; (3) the inclined plane.

A lever is the name given to any rod (taken as absolutely rigid and inflexible) capable of motion about a fixed point or support (*fulcrum*), and under the influence of two forces and the reaction at the fulcrum. Since the purpose of machines is to overcome resistance or weight, one force resists motion and the other produces it. Levers may be straight or bent, but in either case the power, P (the force exerted), the weight, W (the force overcome), and the fulcrum, F, may be arranged in three different ways, whence the usual division of levers into the first, second, and third orders. The arrangement may be represented thus:

(1)	P	F	W
(2)	P	W	F
(3)	W	P	F

In all, however, the general principle of the lever is satisfied—viz., that the power and weight vary inversely as their distances from the fulcrum. This may be expressed for equilibrium, thus:

$$P \times FW = W \times FP.$$

Generally, therefore, the inference holds good that the smaller the power the greater the distance it must move through, and that a gain in power is, hence, a loss of speed. In the second and third orders it is always speed which is gained, power being lost—lf. (*i.e.*,) at a disadvantage.

The first order of levers includes balances, see-saws, scissors, and spades in the act of raising earth; the second, crowbars and wheelbarrows; and the third, sugar-tongs and fishing-rods.

A pulley (which, like the *wheel and axle*, is equivalent to a continuous lever) is simply a cylinder with a groove cut on its circumference to carry a rope; it is capable of rotation about an axis carried in a piece called a block. The figure illustrates a movable pulley A and a fixed pulley B. Suppose a weight carried at *b*. Then the whole weight (W) is carried by the portions of the cord *ab* and *cd*, the tension in each being $= \frac{W}{2}$. If the cords are not parallel the forces must be resolved, and the tension in the cord being greater there is a loss of power.

A movable pulley comprises a number of wheels in a block: this apparatus is called a block and fall. A combination of pulleys in one machine is called a system. The most common combination is a block and tackle, consisting of two blocks containing pulleys. The upper is fixed, the lower carries the weight. The rope is fastened to one or other of the blocks, and passes round the sheaves or wheels.

The inclined plane is a device for the lifting of weights. If a body rests on a horizontal plane, the plane sustains the whole weight. If the plane be inclined, however, only a part of the weight is carried by the plane; hence the use of this device.

The wheel and axle is a wheel provided with a cylindrical axle, both wheel and axle being fitted to take a rope round the circumference. When it is required to lift a weight, this is attached to the axle rope, and the power is then applied to the wheel rope, the power supporting a larger weight in proportion to the diameters of the wheel and axle.

MACHINES, AUTOMATIC, are machines which, when set in motion with an adequate supply of motive power, perform a series of operations without

further intervention from the man in charge. Wood-working and metal-shaping machines, for instance, turn out in a practically finished state articles often of intricate shape, the man in charge having only to place the piece of wood or metal in position, adjust and oil the machine, and apply and shut off the power. Weighing appliances afford most perfect examples of automatic machines, as in them no external power is required, and no supervision after first adjustment. Slot machines for the sale of small articles or ascertaining one's weight, automatic voting machines, and the cash register, are other examples of automatic action.

MACHINES, BINDING. See BINDING MACHINES.

MACHINES, BOMBING. See BOMBING MACHINES.

MACHINES, CALCULATING. See CALCULATING MACHINES.

MACK, VON LEIBERICH, KARL, BARON (1752-1828), Austrian lieut. field-marshal; distinguished in Turk. War, 1788-91, and won glory in recapture of Belgium, 1790-91; commanded Neapolitan army, 1798, and was captured by Napoleon; quartermaster-gen. at headquarters, 1805, and imprisoned for disasters.

MACKAY (21° 10′ S., 149° 5′ E.), seaport, Queensland, Australia, on Pioneer River; outlet of several copper and gold fields. Pop. 4,500.

MACKAY, CLARENCE HUNGERFORD (1874), capitalist. President of numerous cable and telegraph companies. Director of Metropolitan Opera Company, Westchester Racing Association. Vice-president and founder of New Theatre. President of association which raised money for purchase of log cabin in which Abraham Lincoln was born and Lincoln farm in Kentucky.

MACKAY, HUGH (*c.* 1640-92), Scot. general; important influence in securing Scotland for William of Orange, 1688; defeated at *Killiecrankie*, 1689.

MACKAY, JOHN WILLIAM (1831-1902), American financier; *b.* in Dublin, Ireland; *d.* in London. In 1840 he came to the United States and was later engaged in shipbuilding. In 1851 he was a miner in California and Nevada and one of the discoverers of the Bonanza Mine of the Comstock lode in which he owned a two-fifth share. With Flood, Fair, and O'Brien he founded the Bank of Nevada, of which he was long president. A grievance against Jay Gould caused him to unite with James Gordon Bennett in founding the Mackay-Bennett Cable Co., and the Postal Telegraph Co., which led to a long rate war.

MACKAYE, PERCY (1875), dramatist. Educated at Harvard College. 1906-1913, lectured at many colleges on the theater. 1908, delivered Harvard, Phi Betta Kappa poem. 1920, appointed to first American fellowship in poetry and drama at Miami University, Oxford, Ohio. Author of: *The Canterbury Pilgrims*, 1903, produced in 1909; *Fenris the Wolf*, a tragedy, 1905; *Jeanne d'Arc*, a tragedy, produced in New York and London, 1906; *Sappho and Phaon*, tragedy, produced 1907; *The Scarecrow*, 1908; *Lincoln Centenary Ode*, 1909; *Mater*, comedy, produced 1908; *Poems*, 1909; *A Garland to Sylvia*, comedy, 1910; *Sinbad the Sailor*, 1912; *The Immigrants*, 1915; *A Thousand Years Ago*, 1914; *The Present Hour*, poems, 1914; *A Substitute for War*, 1915; *American Consecration Hymn*, 1917; *Community Drama*, 1917, essay; *Rip Van Winkle*, folk-opera, produced, 1920, Chicago Opera Association and many others.

M'KEESPORT, city of Allegheny County, Pa., located at the junction of the Allegheny and Youghiogheny Rivers and served by the Pennsylvania, New York Central, Baltimore and Ohio and Pittsburgh and Lake Erie railroads. It was chartered as a city in 1890 and has great industrial importance. It contains the largest tin plate plant in the world and many great iron and steel works, one of which alone employs over 6,000 men. Its coal and lumber trade is also extensive. There are many handsome public and private buildings, 14 public and parochial schools, 50 churches, 7 banking institutions and 3 daily and weekly newspapers. Pop. 46,781.

M'KEES ROCKS, borough in Allegheny County, Pa., on the Ohio River, three miles from Pittsburgh. It is served by the Pittsburgh and Lake Erie and the Pittsburgh, Chartiers and Youghiogheny Railroads. Iron and steel are the chief manufactures, and these have the advantage of abundance of natural gas and bituminous coal in the immediate vicinity. Lumber, wall plaster and concrete industries also furnish employment to many. The town was settled in 1830 and incorporated in 1892. There are good schools, churches, four banks and one newspaper. Pop. 1920, 16,713.

M'KELLAR, KENNETH DOUGLAS (1869), United States Senator; *b.* in Richmond, Dallas County, Ala. He graduated from the University of

Alabama, 1890 (LL.B., 1892), and then moved to Memphis, Tenn. Democratic Presidential Elector, 1904. Delegate to the National Democratic Convention, 1908. Congress, November 9, 1911, to fill the unexpired term of General George W. Gordon; re-elected to the 63rd and 64th Congress. U. S. Senator for the term 1916-1923.

M'KENDREE COLLEGE. At Lebanon, Ill., founded in 1828 under the auspices of the Methodist Episcopal Church. It was first known as Lebanon Seminary and opened in 1830. Abraham Lincoln helped to secure a new charter in 1839 which gave the institution university privileges. The courses provided are scientific, music, law and graduate. A.B. and B.S. degrees are conferred. Students, 125; teachers, 18. 1922-1923.

M'KENNA, JOSEPH (1843), American jurist; *b.* in Philadelphia. In 1855 he moved to California, graduating from Benicia Collegiate Institute in 1865, and was admitted to the bar. Assistant district attorney of Solano County, 1866-1868; Republican Senator, California Legislature, 1875-1878; member of 50th, 51st and 52nd Congress; resigned, 1893, to become U. S. circuit judge of Ninth Federal Dist.; resigned in 1897 when appointed U. S. attorney-general and succeeded Justice Field, retired, as associate justice of U. S. Supreme Court.

M'KENNA, RT. HON. REGINALD (1863), Eng. barrister and politician; educated King's Coll., London, and Trinity Coll., Cambridge; Liberal M.P. for N. Monmouthshire, 1895-1918; financial secretary of the Treasury, 1905; president of Board of Education, 1907-8; first lord of the Admiralty, 1908-11; home secretary, 1911-15; chancellor of the Exchequer, 1915-16, and, as such, won fame for his budget of Sept., 1915, which was recognized as an able attempt to deal with the financial conditions arising out of the war. He introduced the New War Loan in June, 1915; retired from politics to take up chairmanship of the London Joint Stock and Midland Bank, 1919.

M'KENNA, STEPHEN (1888), Eng. novelist; educated at Westminster and Christ Church, Oxford; member of government mission to U. S., 1917; works include *Sheila Intervenes*, 1913; *The Sixth Sense*, 1915; *Sonia*, 1917, *Midas and Son*, 1918; *Sonia Married*, 1919, *Lady Lilith*, 1920.

MACKENSEN, AUGUST VON (1850), Ger. soldier; indirectly of Scot. descent; served in the Hussars during the Franco-Prussian war and rose rapidly in the favor of William II., being elevated to the peerage, 1899. He was given command of the Death's Head (Life Guard) Hussars, and later of the 17th Army Corps at Danzig. In the World War he achieved a reputation in Germany almost rivaling that of Hindenburg, who selected him to carry out the great drive against the Russians in May, 1915. He completed the conquest of Serbia, 1915-16, and had charge of the offensive against Rumania from the Dobrudja, 1916-17. After the Armistice he was interned by order of the Hungarian government, later taken to Salonica, and authorized by the Supreme Allied Council to return to Germany, Nov., 1919, where he was received with enthusiasm.

MACKENZIE (65° N.; 125° W.); river, N. W. Canada; falls into Arctic Ocean after a course of about 2,500 miles.

MACKENZIE, SIR ALEXANDER (1755-1820), Canadian explorer; Mackenzie River is named after him.

MACKENZIE, COMPTON (1883), Eng. novelist, *s.* of Edward Compton the actor; served as war correspondent in 1915; director, Ægean Intelligence Service, 1917; works include *The Passionate Elopement*, 1911; *Carnival*, 1912; *Sinister Street* (vol. I.), 1913; (vol. II.), 1914; *Guy and Pauline*, 1915; *Sylvia* and *Sylvia and Michael*, 1918; *Poor Relations*, 1919, and *The Vanity Girl*, 1920. These works have all been dramatized, and he has also produced an original comedy, *An Active Couple*, 1920.

MACKENZIE, HENRY (1745-1831), Scot. novelist; a leading figure in old Edinburgh literary life; one of the first to appreciate Burns in print. His *Man of Feeling*, pub. 1771, was popular.

MACKENZIE, SIR MORELL (1837-92), Eng. physician; distinguished throat specialist, physician to Throat Hospital (London) and London Hospital; attended Crown Prince (afterwards Frederick III.) of Germany, 1887, diagnosing and treating an affection of his throat as a simple growth, in opposition to the Ger. physicians, who considered it to be malignant, which it proved later to be.

MACKENZIE, WILLIAM LYON (1795-1861), Canadian politician and journalist; ed. of *Colonial Advocate*, 1824-33, and became leading demagogue; government attempted in vain to suppress paper; M.P. for York, 1828; several times expelled, but re-elected until writ was suspended; organized the rebellion of Upper Canada, 1837-38; lived in U. S. A. till 1849.

MACKEREL (*Scombridae*), a widely distributed family with fifty species, some of which are important food fishes. All are rapid swimmers and seek their food near the surface of the sea. The best-known form, the beautiful blue and silvery M. (*Scomber scombrus*), is an abundant food fish. The Bonito (*Sarda*), a graceful blue-banded fish found throughout the Atlantic and Mediterranean, is also a fair food fish; largest of the M. family is important Mediterranean species, the Tunny.

MACKINAC, MACKINAW (45° 58′ N., 84° 35′ W.), city, summer resort, on M. island, at entrance of Straits of M., Michigan; near it is Fort Mackinac.

M'KINLEY, MOUNT (63° 30′ N., 151° W.), mountain, Alaska, highest in N. America (20,500 ft.); first scaled by Hudson Stuck, 1913.

M'KINLEY, WILLIAM (1843-1901), twenty-fifth President of the United States; *b.* Niles, Ohio. He studied at Allegheny College, Pa., 1860-61, but was forced by illness to discontinue his college course, and for a time taught in a public school. He enlisted in the Union Army in 1861, was made second lieutenant for conspicuous service at Antietam, and at the close of the war had the rank of brevet-major and was serving on the staff of General Carroll. In 1867 he was admitted to the Ohio bar and began practice at Canton. He was elected to Congress in 1877; served for six years in that body; was again chosen in 1885 and twice re-elected. In Congress he speedily became a leader and served with distinction on many important committees, becoming chairman of the Ways and Means Committee in 1889. His advocacy of the tariff and the passage of the tariff bill that bore his name gave him a national reputation. He was chosen governor of Ohio in 1892 and was re-elected in 1894. In 1896 he was nominated for President on the Republican ticket and elected. The Spanish-American War was the most important event of his administration, which was marked also by a great revival of business prosperity. In 1900 he was renominated for the Presidency, and again elected by the greatest popular majority ever received by a candidate up to that time, his defeated opponent being this time, as in 1906, William J. Bryan. On Sept. 6, 1901, while attending the Buffalo Exposition, he was shot twice by an anarchist, Leon Czolgosz, and died eight days later. His funeral was marked by extraordinary demonstrations of national respect and grief, while notable tributes to his memory were paid in foreign capitals.

M'KINNEY, a city of Texas. Pop. 1920, 6677

MACKINTOSH, SIR JAMES (1765-1832), Scottish philosopher, historian, politician, and lawyer; wrote against Burke's *Reflections on the French Revolution*, *Vindiciae Gallicae*, best Radical vindication of Revolution, which Mackintosh ultimately came to condemn; eloquent, earnest reformer, center of literary circle.

M'LEAN, GEORGE PAYNE (1857), United States Senator; *b.* in Simsbury, Conn. Graduating from the Hartford High School in 1877, he was admitted to the bar in 1881. Member of the Connecticut Legislature, 1883; chairman of the Commission on State Prisons, and author of the Bill creating a Board of Pardons; clerk of the Board of Pardons of Connecticut, 1884-1901; member of the commission to revise the state laws of Connecticut, 1892-96, and also counsel for State Comptroller and State Treasurer. Governor of Connecticut, 1901-03. Republican Senator from Connecticut for the terms 1911-17 and 1917-23.

MACLEAN, JOHN (1785-1861), an American statesman and jurist, *b.* in Morris co., N.J. After practicing law he was elected to Congress in 1812 and again in 1814. He served as judge of the Supreme Court of Ohio and was appointed postmaster general in 1823. He was appointed to the Supreme Court of the United States, and in 1856 was one of the Republican candidates for the presidential nomination.

MACLEOD, FIONA. See SHARP, WILLIAM.

MACLISE, DANIEL (1806-70), Irish painter; made himself famous by his *All-Hallow Eve*, 1833. His best pictures are familiar by engravings.

MACMAHON, MARIE EDMÉ PATRICE MAURICE DE, DUKE OF MAGENTA (1808-93), Fr. Pres. and soldier; *b.* at Sully, near Autun; served repeatedly in Algeria, *c.* 1828-55; in Crimean War, 1855, he captured Malakoff works; crushed Kabyles in Algeria won battle of Magenta, 1859; gov.-gen. Algeria, 1864-70; commanded in Alsace 1870; capitulated at Sedan; Pres. 1873-79.

M'MASTER, JOHN BACH (1852), American university professor and historian; *b.* in Brooklyn. He graduated from the College of the City of New York in 1872. Instructor in civil engineering, Princeton, 1877-1883; professor of American History, University of Pennsylvania, 1883-1920; then pro-

fessor emeritus, Litt.D., University of Pennsylvania, 1894; LL.D., Washington and Jefferson University, 1901; of Toronto University, 1907; vice-president, 1904, and president, 1906, of American History Association. Publications include *History of the People of the United States*, 1883-1912 (8 vols.); *School History of U. S.*, 1897; *Daniel Webster*, 1902; *Brief History of the United States*, 1907; *Life and Times of Stephen Girard*, 1917; *The United States in the World War*, 1918. Associate editor, History Review, 1896-1899.

MACMILLAN, DONALD BAXTER (1874), American explorer; *b.* in Provincetown, Mass. Graduated from Bowdoin, 1898, A.M., 1910, Sc.D., 1918; Harvard Extension, 1910-12; Principal Levi Hall School, North Gorham, Mass., 1898-1900; head of classical department Swarthmore Preparatory School, 1900-03; instructor Worcester Academy, 1903-08. With Peary Arctic Expedition, 1908-09; the Cabot Labrador Party, 1910; ethnographic work among the Esquimaux, 1911-12; leader of Crocker Land expedition, 1913-17; professor of anthropology at Bowdoin; Ensign U. S. N. R. aviator, 1918-19; commander of MacMillan Baffin Land expedition, 1920-23. Author *Four Years in the White North*, 1918. Lecturer. Fellow American Geographical Society.

MACMONNIES, FREDERICK WILLIAM (1863), American sculptor; *b.* in Brooklyn. He studied at Academy of Design and Art Students League, and later in Munich and the Beaux Arts, Paris, under Falquiére. National Academy of Design prize, 1884; Beaux Arts, 1886; *Diana* in Paris salon, 1889; second Medal Salon, 1891, for *Nathan Hale*, in City Hall Park, New York; first class gold medal, Antwerp, for *J. S. Stranahan*, now in Brooklyn; Grand Prize, Paris Exposition, 1900; medals Atlanta, Buffalo and Philadelphia Expositions. His most noted works include *Faun with Heron*, 1892; *Sir Henry Vane*, Boston Public Library, 1893; *Bacchante with Infant Faun*, Metropolitan, 1894; *Victory*, for Battle Monument at West Point; *Shakespeare*, Congressional Library, 1898; *Army and Navy Group*, for soldiers and sailors arch, Brooklyn, 1900; equestrian statues of Roosevelt and McClellan; colossal group, *Civic Virtue*, city hall park fountain, New York City.

M'NARY, CHARLES LINZA (1874), United States Senator; *b.* in Salem, Ore. Graduated from Leland Stanford, Jr., University, 1896-98, and in latter year was admitted to the bar; deputy district-attorney for 3rd Judiciary Dist., Oregon, 1906-13; justice Supreme Court of Oregon, 1913-15; U. S. Senator for unexpired term of Harry Lane, deceased, 1917-19; dean Willamette Law College; president Salem Board of Trade, etc.; president Taft-Sherman Club, 1912; chairman Republican Central Committee, 1916-17; U. S. Senator for term 1919-25.

MACOMB, city and county seat of McDonough co., Ill., about 65 miles northwest of Springfield and served by the Chicago, Burlington and Quincy railroad. It is located in an agricultural section, and the presence in its vicinity of large deposits of fire-clay contribute to its prosperity. Its settlement dates back to 1841, but it was not incorporated until 1857. It has a large trade in coal, lumber and agricultural products and its chief manufactures are pottery stoneware and sewer-pipe. Besides having good public schools it is the site of the Western Illinois State Normal School. There is a library of 10,000 volumes, churches, 4 banks and 4 newspapers. The water works are municipally-owned. The city government is administered by a mayor and a council. Pop. 1920, 6,714.

MACOMB, ALEXANDER (1782-1841), American soldier; *b.* in Detroit, Mich.; *d.* Washington, D. C. Joined U. S. Army as a cornet of cavalry, 1791; lieutenant-colonel of engineers and adjutant-general in the army in 1912 and transferred to artillery. As colonel of 3rd Artillery he fought with distinction at Fort Niagara and Fort George. A brigadier-general in 1814, he commanded the frontier along Lake Champlain and on September 11, defended Plattsburgh, N. Y., against a strong British force under Sir George Provost. He was promoted major-general, receiving thanks, and a medal from Congress. After the war he was colonel of engineers, and from 1828 until death commanding-general of U. S. A. Author *Treatise on Martial Law and Courts Martial*, 1809; *Treatise on Practice of Courts Martial*, 1840.

MACÔN (46° 19 N.; 4° 50′ E.); town, Saône-et-Loire, France, on Saône; ancient *Matisco*; remains of ancient cathedral; brass foundries; wine. Pop. 19,500.

MACON, city and county seat of Bibb co., Ga., on the Ocmulgee River, 125 miles from Augusta. It is the most important railroad center in the State, being served by six trunk lines. It is surrounded by a rich cotton growing region and is the fourth inland cotton market in the United States. The Ocmulgee is navigable to the ocean and

gives immediate connection with coastwise and ocean shipping. Besides being the great clearing house for the fruit belt of Central Georgia, it has many great and diversified industries, and these are fostered by the hydro-electric power furnished by a dam 36 miles up the river which serves for electric lights, the operation of the street cars and the running of factories. The principal manufactures are agricultural implements, cotton goods, cloth, yarn, hosiery, tire fabrics, cottonseed oil, cake and meal, terra cotta, furniture, confectionery, saddlery and wagons. The city is handsomely laid out and has magnificent roads not only within its limits but radiating from it in all directions. There are numerous parks, more than 40 churches, excellent schools, 8 banks and trust companies, two public libraries and 6 daily and weekly newspapers. The city has many imposing public and private buildings, including halls of the Masons, Knights of Pythias, Elks, Odd Fellows and other orders. The water supply is of the best and cost $1,000,000 to install. The government is in the hands of a mayor and 12 aldermen. Macon was settled in 1822 and received a city charter in 1832. Pop. 1920, 52,995.

MACON, NATHANIEL (1758-1837), American politician; *b.* in Warren co., N. C.; *d.* in Virginia. Studied at College of New Jersey (Princeton), 1774-76. In 1780 he commanded North Carolina militia in the battle of Camden; State Senator, 1781-85; delegate to Congress in 1786, but declined, preferring state service; member House of Representatives, 1791-1815; leader of North Carolina delegation. He supported Jefferson and opposed abolishing foreign slave trade. Voted declaration of war against Great Britain in 1812, but opposed a large army when peace was restored. U. S. Senator from 1815 to 1828, when he retired. The Randolph-Macon College was named after him and John Randolph.

MACPHERSON, JAMES (1736-96), Scot. 'translator' of Ossian; *b.* Ruthven, Inverness-shire. After traveling through the Highlands in search of Gaelic MSS. he pub. *Fingal* and *Temora*, supposed translations from original Gaelic of Ossian.

MACPHERSON, JAMES BIRDSEYE (1828-64), Amer. soldier; brigadier-general, 1862, and major-general, 1863; killed at battle of Atlanta.

MACQUARIE (53° 30′ S.; 159° 30′ E.), island group, S. Pacific; dependency of New Zealand.

MACREADY, WILLIAM CHARLES (1793-1873), Eng. actor; first appearance was at Birmingham as Romeo; first London success was as Rob Roy; interpretations of Shakespeare's heroes were good.

M'REYNOLDS, JAMES CLARK (1862), American lawyer and statesman; *b.* in Elktown, Ky. He graduated from Vanderbilt University, 1882, and from University of Virginia law department, 1884. In the practice of law at Nashville, Tenn., he gained a wide reputation. He became professor of law school, Vanderbilt University and was appointed assistant attorney-general of the United States, 1903-07. Establishing a law office in New York he was counsel for the government in the tobacco trust, coal, railroads and other cases. In 1913 he succeeded Wickersham as U. S. attorney-general when he had to deal with the International Harvester, South Pacific, American Telephone and Telegraph, the Reading, and New York, New Haven R. R. cases under the Sherman anti-trust law. Appointed associate-justice, U. S. Supreme Court, August, 1914, seated in October.

MACROBIUS, AMBROSIUS, THEODOSIUS, Rom. writer of early V. cent.; wrote *Saturnalia*, containing much information about history, myths, philosophy, science

MACUMBER, PORTER JAMES (1858), an American statesman, *b.* in Crete, Ill. He was educated at the University of Michigan and for many years practiced law. He served in the House of Representatives from 1885 to 1889 and was elected United States Senator in 1899, serving until 1923. He was defeated for re-election in 1922. He was chairman of the State Finance Committee from January, 1922 until March 4, 1923.

MACVEAGH, WAYNE (1833), Amer. Republican politician.

MACVICKAR, WILLIAM NELSON (1843-1910), an American Protestant Episcopal bishop, *b.* in New York City. After serving as rector in several churches in New York and Philadelphia he was appointed coadjutor bishop of Rhode Island in 1893. He became bishop in 1903.

MADAGASCAR (12° to 25° 30′ S.; 43° 12′ to 50° 30′ E.), large island off S. E. coast of Africa; is separated from Africa by the Mozambique Channel on the W.; area, *c.* 228,000 sq. miles; eastern part is of Archæan, western of Secondary formation; interior rugged with mountains and mountain chains rising to 3,000-5,000 ft., sloping down on both sides to low ground about 600 ft. above

sea-level; between ranges are plateaux, and highest part of island is near center, where Ankaratra, probably an extinct volcano, reaches height of 9,000 ft.; drained by Onilahy, Mangoky, Tsiribihina, Betsiboka, and other streams; largest lake, Alaotra. Capital, Antananarivo; important towns are Diego Saurez, Fianarantsoa, Tamatave. Climate hot and unhealthy on coasts, more temperate and healthy in interior.

Modern European knowledge of M. dates from 1500, when it was sighted by Diago Diaz and named São Laurenço; it is said to have been visited by Almeida in 1506. Early Portuguese and Dutch attempts at colonization proved unsuccessful, and the first Portuguese settlement, established in 1548, was destroyed in following cent. by French. Their settlement at Fort Dauphin was seized by English in 1810-11, and the territory was in 1818 ceded to King Radama on his abolishing slave trade. Under Radama Christianity was introduced; but on his death power was seized by Queen Ranavalona I., who was opposed to Christianity, expelled missionaries, and persecuted native Christians. Under her successors, Radama II., Rasohèrina, and Ranavalona II., Christianity was again encouraged, treaties were made with England, France, and America, and considerable progress was made.

In 1883 war with France broke out, and in this year also Ranavalona II. *d.* and was succ. by Ranavalona III. War continued for two years, and ended in 1885, when treaty was made whereby France obtained Diego Saurez and the right partially to control foreign affairs of island, while a Fr. Resident was to be sent to the capital. French increased their demands in 1894, and on these being rejected sent force against island in 1895. Fr. protectorate was established in same year, the queen being allowed to remain on throne; but in 1896 rebellion occurred, and M. was annexed to France, Ranavalona III. being banished to Algeria. After this several insurrections broke out, but by 1901 whole island had submitted to Fr. control. Trade and education have made rapid progress in recent years; and in 1907 a large number of gold-mining concessions were granted.

M. has luxuriant vegetation, most valuable trees being bananas, cocoanuts, orange and mulberry trees, areca palms, pandunas, acacias, ebony; also produces rubber, cotton, hemp, rice, manioc, coffee, cacao, vanilla, tobacco, sugar-cane. Minerals include gold, copper, iron, lead, silver, antimony, sulphur, lignite, salt. Railway mileage, *c.* 190. Pop. 1920, 3,512,390. See MAP OF AFRICA.

MADDALONI (41° 1′ N., 14° 23′ E.), town, Caserta, Italy. Pop. 21,000.

MADDER (*Rubia*), genus of plants, order Rubiaceæ; used in dyeing until superseded by alizarin.

MADEIRA, THE MADEIRAS (*c.* 33° N., 16° 45′ W.), islands, Atlantic Ocean, about 700 miles W. of Lisbon. M. was visited by Portug. explorers in 1820, when it was annexed to Portugal, remaining in possession of Portug. government almost without interruption until present time; first permanently settled, *c.* 1431; taken and held by British for short time in 1801 and in 1807-14. The group comprises M., Porto Santo, and three uninhabited Desertas; total area, 314 sq. miles. M. is an irregular oval in shape; area, *c.* 270 sq. miles; surface mountainous, rising to over 6,000 ft. in Pico Ruivo; has fine climate and is favorite health-resort, especially for consumptive patients; chief town, Funchal, is port of call for Atlantic steamers; exports fruits, wines, vegetables, sugar, tobacco; Madeira wine is well known, and is made from mixed white and black grapes. Porto Santo is a hilly island, with practically no products; it was visited by Columbus. Pop. 185,000. See MAP OF THE WORLD.

MADEIRA WINE is manufactured in the Madeira Is. from a mixture of black and white grapes; when vinted separately these grapes produce Tinta and Verdelho wines. High-class wines known as Bual, Sercial, and Malmsey are also manufactured in Madeira. The vines were brought from Cyprus or Crete in the 15th century; in 1852 they were totally destroyed by the oidium disease, but new shoots were afterwards replanted.

MADERO, FRANCISCO INDALECIC (1873-1913), Mexican statesman; *b.* in San Pedro, Coahuila; *d.* Mexico City. Educated at the Jesuit College and University of California; he later gained wealth in the cotton and banking business. In 1900, when living in the City of Mexico, he became prominent as a political reform leader, and published a book opposing the dictatorship of Diaz and urging a single presidential term. He ran for president in 1910, but Diaz had him imprisoned on a fabricated charge and did not release him until too late to oppose Diaz' election. Madero now headed a revolution which broke out at Pueblo, November 20, 1910, and spread rapidly. He set up his government at Juarez, May 11, 1911. Diaz made peace with the revolutionists and Madero became president on October

1. But he was unable to handle the revolutionary elements and in 1912 there was an uprising led by Zapata in the south, and by Felix Diaz, a nephew of the ex-president in the north. Madero crushed the movement and imprisoned Diaz, but soldiers in Mexico City revolted February 9, 1913, and freed Diaz and General Reyes. Then General Blanquet arrived with troops and joined Huerta (Madero's commander-in-chief) in overturning the government. Madero was imprisoned on February 19, and was shot with the vice-president Suarez when taken from prison to the place of trial. Huerta was accused of having planned the shooting, which he denied, but was forced to resign his office.

MADISON, town in Madison co. Ill., directly across the Mississippi from St. Louis, with which it is connected by the Merchant's Bridge. It derives considerable industrial importance from the fact that it is the junction point of eleven railroad lines, chief of which is the Illinois Central. It has steel mills, car shops, foundries and other plants. There are good schools, churches, three banks and a newspaper. Pop. 1920, 4,996.

MADISON, city and county seat of Jefferson co., Ind., located on the Ohio River and on the Pittsburgh, Cincinnati, Cleveland and St. Louis railroads. It was settled in 1808 and incorporated in 1824. It has a thriving river commerce and is a trade center for a considerable section not only of Indiana but of Kentucky. Tobacco is one of its chief staples of commerce and it has many industrial establishments, of which the leading ones are flour, lumber, cotton and woolen mills, foundries, machine shops and furniture factories. There are 3 banks and 4 newspapers. It has a good public school system and Hanover College is in its immediate vicinity. The waterworks are municipally owned. Pop. 1920, 6,711.

MADISON, county seat of Dane co., Wis., and capital City of the state. Its origin dates back to 1837 and it received a city charter in 1856. It is beautifully located at an altitude of 974 feet above sea level. Its interests are served by the Illinois Central, Chicago and Northwestern and Chicago, Milwaukee and St. Paul railroads. There are large manufacturing industries, chief of which are boots and shoes, electrical machinery, agricultural tools and implements, carriages, furniture, boats and batteries. The charming lakes in the vicinity make it a popular summer resort, and its system of roads is one of the most perfect in the state. The city is handsomely laid out, and abounds in notable structures, such as the State Capitol, which cost nearly $7,000,000 and has the second highest dome in the United States; the State Historical Society Building and the noble buildings of the University of Wisconsin. As an educational center it is noted throughout the Union. The magnificent library of the State Historical Society contains over 250,000 volumes. There are about thirty churches in the city. The public schools are well equipped and maintain a high standard. The city has 14 banks and 24 newspapers and periodicals. The government is vested in a mayor and common council. The waterworks are owned and operated by the city. Pop. 1920, 38,378.

MADISON, JAMES (1751-1836). fourth President of the United States, *b.* in Port Conway, Va.; *d.* in Montpelier, Va. He graduated with high honors from the College of New Jersey (now Princeton) in 1771. Ill health prevented him from joining the army during the Revolution, but he worked strenuously for the cause. A delegate to the Virginia Convention of 1776 he was one of 32 presenting the Declaration of Rights by George Mason. Madison supplied an amendment to the last clause, providing freedom of religion and opposing a state church. He was a member of the Council of Virginia, 1878-1880; delegate to the Continental Congress, 1880, when he gave instructions to John Jay, Minister to Spain to seek a treaty with Spain against England on condition that the United States should enjoy free navigation of the Mississippi from the source to the sea. Spain proposed to close the river to the United States for 25 or 30 years. Madison fought this plan in Congress and won. In 1795, Spain by treaty offered the United States freedom of the river and New Orleans as a depot for goods. Spain ceded Louisiana to France in 1800, which Madison first learned of as Secretary of State in Jefferson's cabinet in 1801. In the fall of 1802 when the Spanish representative in New Orleans forbade the United States to store goods there, or use the Mississippi, war with Spain, or France, was imminent. The danger passed when Napoleon offered to sell Louisiana to the United States. At the Constitutional Convention in 1787, Madison's views on U. S. government were presented by Virginia delegates, and many of his ideas were incorporated in the Constitution. After the document was offered to the States it was first ratified by Virginia, largely owing to his efforts; and opposed by Patrick Henry. Madison was elected to the first House of Representatives, but

Henry prevented him from becoming Senator. Secretary of State under Jefferson for eight years he introduced retaliation against France and England in trade by taxing imports. Elected President in 1809 he exhausted every effort for peace with England. The United States entered the war unprepared. Madison was not a good military leader.

MADISON RIVER. A stream in Montana that rises in the Rocky Mountains at an elevation of 8,300 feet and flows through Madison co., joining the Jefferson Fork of the Missouri at Three Forks. It is about 230 miles long.

MADISONVILLE, city and county seat of Hopkins co., Ky., 125 miles southwest of Louisville and served by the Kentucky Midland and Louisville and Nashville railroads. It is in the heart of a rich agricultural section, of which it is the natural market and shipping point. Coal and natural gas in the vicinity contribute to its prosperity. Its manufacturing plants include a tobacco factory, lumber and planing mills and flour mills. Thousands of acres in the immediate vicinity are planted in tobacco, and the transformation of the raw leaf into finished products is one of the principal industries. There are excellent schools, churches, 4 banks and 3 newspapers. The electric light, waterworks and sewage systems are municipally owned. Pop. 1920, 5,030.

MADNESS, see INSANITY.

MADOC, or **MADOG,** the second son of Owen Gwynedd, Prince of Wales. Lived in the 12th century. According to a Welsh legend, he is said to have discovered America about 1170, at which time he was forced to fly from Wales on account of a rebellion against his dynasty, which proved successful. He is believed to have sailed on a second voyage of discovery, since when he was heard of no more. His story forms the subject of a poem by Southey, entitled *Madoc,* 1805.

MADONNA (It. for 'Our Lady'), a title reserved in the Roman Catholic Church for Mary, the mother of Jesus. She was the wife of Joseph, a carpenter of Nazareth. Inasmuch as Mary is the 'Mother of God', she has been exalted, and has grown to be the object of profound popular devotion; for by virtue of her motherhood she is deemed the supreme intercessor with her Son. The countless paintings, images, and statues of the 'Madonna and Child' are all inspired by the thought that through the Virgin the human touches the divine.

MADRAS (*c.* 8° 4′ to 20° 18′ N., 74° 30′ to 85° 30′ E.), presidency and administrative division of India. M. was colonized by English in 1639, when the East India Company established themselves there; held by French, 1746-48, when Brit. regained possession; further hostilities with French ended about 1761; war against Hyder Ali and Tippoo Sahib of Mysore ended in 1799, since when Brit. possession has been undisturbed except by occasional native risings. M. occupies whole width of Indian peninsula S. of river Kistna and its tributary Tungabhadra, and extends nothward along E. coast as far as Lake Chilka; area, 141,726 sq. miles; produces large crops of cotton and tobacco, also rice, millet, pulse, ground-nuts, oil seeds, sugar-cane, spices, indigo, cocoa-nuts, areca-nuts, dates; on hills, tea, coffee, cinchona, cardamoms are grown; valuable teak forests. Minerals include gold and iron, but await development. Exports raw cotton, seeds, rice, indigo. Pop. 42,000,000. See MAP CENTRAL AND SOUTHERN ASIA.

MADRAS (13° 4′ N., 80° 17′ E.), capital, M. Presidency; 9 miles long; as port M. is handicapped by surf; commercial part, the 'Black Town,' is on shore; Europeans live farthest inland; chief buildings: Government House, Senate House, St. George's Cathedral. Original settlement was Fort St. George. Chief exports: tea, coffee, cotton, sugar, dye-stuff, grain, hides, indigo. Pop. 520,000.

MADRID (1) Prov., New Castile, Spain (40° 30 N., 3° 40′ W.); belongs to basin of Tagus; climate arid; agriculture; granite, lime, gypsum, and freestone quarried. Area, 3,084 sq. m.; pop. 953,300. (2) Cap. of Spain and of above prov. (40° 25′ N., 3° 43′ W.), on Manzanares, in center of great sandy plateau over 2,100 ft. above sea-level, subject to extremes of heat and cold. Originally belonged to Moors, from whom it finally passed to Alfonso VI. of Castile, 1083; cap. of Spain under Philip II., 1560; taken by French, 1808; occupied by Wellington, 1812; Ferdinand VII. restored, 1814. Witnessed marriage of Alfonso XIII. to Ena of Battenberg, 1906, when a bomb outrage occurred.

Madrid is archiepisc. see, has cathedral and many churches and monasteries. The principal street, Calle de Alcala, is one of finest in Europe; site of univ., founded 1590, with observatory and magnificent library; numerous educational and charitable establishments. Contains royal palace, Cortes, royal picture gallery with splendid collection of paintings by Velazquez, Rubens,

Titian, and other masters; museums, libraries. Manufactures leather goods. tobacco, furniture, tapestry, glass, porcelain, gold and silver work. Pop, 648,700.

MADRIGAL.—(1) a brief lyrical poem, usually amorous, irregular in construction, and of no specified formula but normally about ten lines long and having the iambic foot dominant. Eng. madrigal writers are Drummond, Lodge, Carew, and Suckling. (2) in music usually a pastoral song sung by four or more voices and without musical accompaniment. Glee singing superseded madrigal singing in the XVIII. cent.

MADSTONE, a stone about the size of a hen's egg, which is considered by superstitious people as a cure for hydrophobia and snake bite.

MADURA.—(1) (7° S., 113° 30′ E.) island, Dutch East Indies, N. E. of Java, from which it is separated by the Strait of Madura. Pop. 1,750,000. (2) (9° 55′ N., 78° 9′ E.) district, Madras, India; mountainous in N. and W.; elsewhere level and fertile; capital, Madura, on Vaigai, is of great historic interest; it contains palace of the former rajahs, and one of the most remarkable temples in India; coffee industries. Pop. (town) 134,130; (district) 2,900,000. See MAP EAST INDIES.

MÆANDER, now **MEINDER,** a river of Asia Minor, which flows into the Aegean Sea. It has a very winding course, thus the verb "meander".

MÆCENAS, GAIUS CILNIUS (*c.* 73 B. C.-8 B. C.), Rom. patron of letters; chief administrator at Rome during the conflict between Octavian and Antony. About the year 16 B. C. he fell into disfavor with Augustus and retired from public life. To him both Horace and Vergil largely owed their fame and the privilege of imperial favor, hence M. has become name for patron.

MAELSTROM (Danish *malstrom,* a great whirlpool in the sea), usually associated with the celebrated whirlpool arising occasionally in a strong current off the island of Moskoe on the W. coast of Norway. It is very dangerous in winter, especially when the N.W. wind interferes with the set of the tide. Formerly it was supposed that it was always dangerous enough to engulf ships at any time. This view was, of course, erroneous.

MAETERLINCK, MAURICE (1862), Belgian dramatist, poet, and essayist; *b.* Ghent; writings are deeply imbued with symbolism and mysticism. *Pelleas et Melisande,* 1892, was his first great drama. Other notable works are *Le Tresor des Humbles,* 1896, setting forth his conception of the dim, mysterious life of the soul; *Douze Chansons,* 1897, a book of verse; *La Vie des Abeilles:* 1901, his best prose work, a delightful mixture of philosophy and natural history; *L'Oiseau bleu* (*The Blue Bird*) 1909, a symbolical play for children; *The Unknown Guest,* 1916; *The Burgomaster of Stilemonde,* 1918; and *Les Sentiers dans la Montagne,* 1919. He visited the United States in 1921.

MAFEKING (25° 52′ S., 25° 41′ E.), town, British Bechuanaland, S. Africa; noted for its spirited defense, Oct., 1899, to May, 1900, by Baden-Powell in Boer War.

MAFIA, MAFFIA, supposed Sicilian secret society. Love of vendetta and scorn for those who have recourse to legal punishment is mark of Sicilian *mafiosi*; violence and assassination common; no proof of existence of organized secret society.

MAGADHA, ancient kingdom, India; capital, Pataliputra, on Ganges; corresponded generally to modern Behar and Oudh.

MAGALLANES (50° S., 75° W.), territory, S. Chile, including the area S. of lat. 47° S., the W. portion of Tierra del Fuego, and the islands of the Straits of Magellan. Pop. 25,000.

MAGAZINES. See PERIODICALS.

MAGDALA (11° 15′ N., 39° 22′ E.), fortified town, Abyssinia; captured by the British under Napier, 1868.

MAGDALENA BAY, an inlet in the west coast of Lower California, forming one of the best harbors on the Pacific Coast, forty miles in length and twelve miles wide. The town of Magdalena is located on its shore.

MAGDALENE, OR MAGDALEN, MARY, the name of a woman mentioned in the Gospels as a disciple of Jesus (Luke viii. 2). It is recorded that seven demons were cast out of her. She apparently came from Magdala or Magadan (modern *El-Mejdel*), near Tiberias. She witnessed the crucifixion of Christ, followed Him to burial, and prepared sweet spices for the sepulchre. The account in John XX. tells how she found the tomb empty and was the first to behold the risen Jesus (see also Mark XVI. 9). From confusion with the woman who anointed Christ's feet in Simon's house (Luke VII. 37), the popular conception of her has been that of one fallen from chastity who later repented of her sins. There

are many famous pictures of the Magdalene by Correggio, Titian, Paul Veronese, and others. She has also been confused with Mary of Bethany, sister of Lazarus, and with the daughter of the Syrophœnician woman (Mark VII.). See legendary *Life* by Hrabanus Maurus IX. cent.; by Vincent of Beauvais, XIII. cent.

MAGDEBURG (52° 9′ N., 11° 38′ E.), town, Prussian Saxony; strongly fortified; strategic importance due to command of road from Köln to Berlin. Taken by Elector of Saxony, 1551; besieged by Wallenstein, 1629; pillaged by Tilly, 1631; captured by French, 1806; restored to Prussia, 1813. Archiepiscopal see since 968; cruciform cathedral dates from XIV. cent. Great railway center. Deals in sugar, grain, chemicals, iron manufactures, etc. Pop. 285,000.

MAGELLAN, FERDINAND, MAGALHAENS (*c.* 1470-1521), Portug. navigator; did good service to Portugal; ill-rewarded, and, with his friend Ruy Faleiro, entered into service of Charles V., and won his support for new attempt to reach Asia by West; sailed down E. coast of America, 1519; turned into strait afterwards called Magellan's, 1520; crossed Pacific, so named by M., as far as Philippines, 1521, undergoing terrible sufferings from scurvy and starvation; treacherously slain by native chief; of his fleet, *Vittoria* alone reached Spain, 1522, having circumnavigated globe; credit belongs to intrepid M.

MAGELLAN, STRAIT OF, between S. America and Tierra del Fuego, 360 m. in length, and varies in width from 2½ m. to 17 m. It was discovered by the Portuguese explorer Magellan in 1520. The strait is difficult of navigation, and is enclosed on the W. by steep wooded mountains.

MAGENTA (45° 28′ N., 8° 52′ E.), town, Lombardy, Italy; silk and matches; French and Sardinians defeated Austrians here, 1859. Pop. 8,000.

MAGGIORE, LAGO, Roman *Lacus Verbanus* (46° N., 8° 30′ E.), lake, N. Italy, on border of Italy and Swiss canton Ticino; traversed by river Ticino; contains the Borromean Islands; length, 37 miles; greatest breadth, 5½ miles.

MAGI (derived from *mag* or *mog*, Pehlvi: priest; *mikguth*, a man who wears his hair in a particular manner; *mogh*, distinguisher), a tribe of the Medians which were set aside for the management of the sacred rites, and for the preservation and propagation of the traditional knowledge. From the Medians, the institution of the M. found its way, under Cyrus, into Persia. They were not only the 'keepers of the sacred things, the learned of the people, the philosophers and servants of God,' but also diviners, mantics, augurs, and astrologers, and no transaction of importance took place without or against their advice.

MAGIC, the working of marvels through supernatural power, has been believed in all through the world's history. Its relation to the primitive forms of religion has often been discussed, but both terms are used loosely, and it is difficult to determine. Various theories of m. have been propounded. Frazer's theory is that belief in m. is accounted for by a 'law of sympathy.' If two things have once been related to each other, there is a permanent bond of sympathy between them. Thus, if it be desired to injure an enemy, a wax figure of him is made, pins are stuck into it, or it is crushed or buried or roasted and magic formulæ are repeated. The enemy will feel the pain and injury which have been inflicted on his image; it would be made securer if his hair or parings of his nails were mixed with the waxen image.

It is extremely difficult to give a satisfactory definition of m. Among savage races by whom it is practiced the term probably hardly occurs. M. is a loose term for a number of rates and customs which only have a unit to outside observers. One characteristic is that it is something private or illicit and exiting side by side with established religious rites.

M. is sometimes divided into 'white,' that which is wrought with good purpose; 'black,' the converse with evil spirits and that which is essentially of malevolent intent. Though the belief in m. is generally confined to uncivilized and uneducated peoples, with the recent interest in Spiritualism and Psychical Research there has been a revival of m. among educated Westerns.

MAGIC LANTERN, or **OPTICAL LANTERN,** an apparatus for projecting upon a white screen enlarged representations of diagrams, pictures, etc., drawn or photographed on glass slides. The instrument is said to have been invented by Athanasius Kircher, who described it in 1646. It was at first used as an amusing toy, but in its later developments is a means of representing small pictures and objects to large audiences.

MAGIC SQUARE, one made of numbers so arranged that any line adds up to the same amount.

MAGNA CHARTA, Great Charter

granted by King John at Runnimede, 1215. General causes leading to it were king's oppression and heavy demands for *scutage*. In 1214 Northern barons refused to pay scutage and took arms against John; and, as the whole populace, for the first time, was united by common interest, the king had to give way to its demands. Conference took place at Runnimede, June 15 to 23. Document called *Articles of the Barons* was accepted and signed by John, June 15. Charter consists of preamble and 63 clauses. Principal provisions: declaration of freedom of Church of England; limitation of feudal obligations (*e.g.*) relief, wardship, and marriage; establishment of fixed royal courts at Westminster, and of assize courts; regulation of fines; all accused persons to be tried by their peers; no taxes to be imposed without consent of Great Council of barons and tenants-in-chief; no imprisonment without lawful trial, and no delay or sale of justice; one standard of weights and measures. Sixty-first clause throws doubt on king's intention of keeping his word, and appoints committee of 25 to enforce his doing so. Four copies of charter still exist. M. C. was ratified and confirmed by different kings.

MAGNA GRÆCIA, group of Gk. colonies, S. Italy; among leading cities were Cumæ, Sybaris, Crotona, Tarentum, Locri, Rhegium, Metapontum, Heraclea, and Neapolis; founded for the most part in VIII. cent. B. C.; conquered by Rome, III. cent. B. C.

MAGNESIA (39° 12′ N., 23° 12′ E.), an ancient district of E. Thessaly, bordering Ægean Sea.

MAGNESIA AD MEANDRUM (37° 40′ N., 27° 32′ E.), ancient city, Ionia, Asia Minor; celebrated for its magnificent temple of Artemis Leucophryne.

MAGNESIA AD SIPYLUM, modern Manissa (38° 36′ N., 27° 28′ E.), ancient city, Lydia, on Hermus; Antiochus the Great defeated here by Scipio, 190 B. C.

MAGNESIUM (Mg = 24·32), metallic element related to zinc; occurs as magnesite $MgCO_3$, dolomite $(MgCa)CO_3$, Epsom salt $MgSO_4,7H_2O$, etc.; obtained by electrolysis of fused chloride. Silvery white, M.P. 632·7, may be made into wire, ribbon, or powder; *magnalium* (MG_2+Al) is a light alloy giving good castings. M. tarnishes in moist air, forming MgO; burns with intensely white and *actinic* light; m. powder, mixed with potassium chlorate, is used for photographic flash-light; rapidly displaces hydrogen from dilute acids, even some from dilute nitric acid. *Magnesia*, MgO, forms salts (*e.g*) sulphate $MgSO_4$-$7H_2O$, basic carbonate $3MgCO_3$, $Mg(OH)_2$, $3H_2O$ = 'magnesia alba.'

MAGNETISM. The simpler magnetic phenomena have been known from very remote times. As early as 2400 B. C. the Chinese had observed that a certain kind of stone, now known as magnetite or magnetic oxide of iron (FE_3O_4), possessed the power of attracting small pieces of iron, and that when a piece of this stone was freely suspended, it invariably set itself so that a certain line in it pointed approximately north and south. But it was not till about the end of the 11th cent. A. D. that these facts became known in Europe. Later it was discovered that iron and steel could be endowed with similar powers by rubbing them from end to end always in the same direction with the end of a *natural* magnet; and still later it was found that the passage of an *electric current* along an insulated wire coiled round a bar of steel or iron converted the bar into a magnet which could be made very powerful by increasing the strength of the magnetizing current. It is by means of *artificial* magnets made by these methods that magnetic phenomena are now studied. Magnetization may be weakened or destroyed by heating in a Bunsen burner or by rough usage.

If a magnet be rolled in iron filings it will be found that the filings cling chiefly around the two ends of the magnet, showing that the magnetic force is chiefly centered there. The points at or near the ends of the magnet at which the magnetic force is strongest are called the *poles* of the magnet—and the line joining the poles is the magnetic axis. Now, let the magnet be freely suspended by a thread around its center, and it will set itself so that one of its poles always points toward north, and the other south. The former is called the north pole of the magnet; the latter its south pole. If one pole of a magnet be brought near to each of the poles of a suspended magnet in turn, it will be found that attraction takes place between two dissimilar poles, but that like poles repel one another. Coulomb showed that the force between any two poles is directly proportional to the product of their respective strengths, and inversely proportional to the square of the distance between them. The quantitative law of magnetic attraction or repulsion is thus precisely identical with the law of electrostatic attraction or repulsion, and also with the law of gravitational force, except that in the latter case the force is always one of attraction, never of repulsion. Further, there is a limit to the amount of magnetization that may be acquired by any magnetic body—

(*i.e.*) by any body capable of being magnetized. When that limit has been reached, the body cannot be more strongly magnetized, however much the magnetizing power applied to it be increased, and it is then said to be magnetically saturated.

Substances that are capable of being attracted by a magnet are known as magnetic or para-magnetic substances. These include—besides iron and steel—nickel, cobalt, liquid oxygen, and certain alloys of manganese, aluminum, and copper. Bismuth and antimony, on the other hand, are repelled where the former class are manganetically attracted; they are called diamagnetic substances. By far the most important magnetic substances are iron and steel; the others exhibit magnetic properties only in very slight degree. Between iron and steel there are important and well-marked differences in magnetic behavior. A piece of soft iron is powerfully magnetized by *induction*, merely by placing it near to or in contact with a permanent magnet, but loses almost all its magnetism as soon as the inducing magnet is withdrawn; a piece of steel similarly treated is but feebly magnetized, but retains its magnetism much better. For this reason iron is preferred wherever powerful electro-magnetic effects are required (*e.g.*) in making pole-pieces and armatures of dynamos, motors, and the like.

Magnetic Field.—The influence exerted by a magnet extends in all directions around it, and the space through which its action can be detected is termed the field of the magnet. The shape of the field for a single magnet, and for various combinations of magnets, was first investigated by Farraday by a method still in use. A sheet of cardboard is laid over the magnet, and iron filings are sprinkled over the cardboard. On tapping the cardboard, the filings will be found to arrange themselves in more or less continuous curves, each radiating out from one pole and bending round to join the corresponding curve radiating from the other pole. These curves represent the *lines of magnetic force*, which are regarded as closed curves passing within the magnet from the south to the north pole, and through the surrounding air from the north to the south pole of the magnet. Each small particle of iron on the cardboard has become a temporary magnet by induction, and in consequence has placed itself in the direction of the magnetic force due to the two poles at the point where it lies. The curves indicate not only the direction but also roughly the intensity of the field, for the field is obviously strongest where the lines are most numerous. Thus around the poles the field is most intense, but its strength rapidly diminishes with distance from the magnet. A field of unit strength is produced at one centimetre distance in air from a unit pole and is represented by one line of force.

The presence of pieces of soft iron in a magnetic field has the effect of distorting the field, the lines of force preferring to pass through the soft iron rather than through the air on account of the greater magnetic permeability of the iron. If a soft iron ring be placed in a strong magnetic field between two poles, iron filings sprinkled over cardboard covering the magnets and ring will show clearly how the field is distorted by the insertion of the ring. The lines of force will crowd together so as to pass in large numbers along the metal of the ring, but within the ring the filings will not arrange themselves in any systematic, orderly way. The soft iron acts as a shield or *magnetic screen* through which the magnetic force cannot penetrate. This screening action of soft iron is of great importance in electro-magnetic work.

Terrestrial Magnetism.—The presence of a magnetic field all over the surface of the earth is evidenced by the fact that a magnetic needle freely suspended and set in oscillation will come to rest pointing approximately north and south. Further, a magnetic needle freely suspended at its center of gravity will not be horizontal; its north pole (in the northern hemisphere) will dip downwards to a greater or less extent. The earth, in short, acts in some respects as though it were itself a huge spherical magnet. Considering the matter in more detail, we observe that the earth's magnetic poles do not coincide with its geographical poles. It follows that as the compass needle points 'magnetic north' (*i.e.*, towards the magnetic north pole) along the magnetic meridian, it does not in general also point true north along the geographical meridian. The angle between the magnetic meridian and the geographical meridian at any place is known as the angle of *declination* or *variation* at that place. This variation varies in different localities, and is not even constant at any given place. Again, the north pole of a magnetic needle suspended by its center of gravity dips downwards, making a certain angle with the horizontal. This angle is known as the angle of inclination or dip.

The earth's magnetic field at any place is completely known when we have determined these three magnetic elements—viz., the declination, the inclination, and intensity either of the total

magnetic force or of its horizontal component. Experimental details omitted, the declination is found by measuring the angle between magnetic north and true north; the inclination is obtained by observing the angle which the north pole of a dipping needle makes with the horizontal when in the magnetic meridian; and the horizontal component of the field is deduced from two sets of observations—the first establishing the period of oscillation of a suspended magnet, and the second determining the amount of deflection produced under certain conditions by the same magnet on the small suspended magnet of a deflection magneto-meter.

Magnetic Maps have been constructed on which lines are drawn connecting places at which a magnetic element has equal values. In one set of these maps lines are drawn connecting places of equal declination. These lines are called *isogonic lines*. There are two *agonic lines*, or lines of no declination, running from north to south, as well as an agonic line in the form of an oval, known as the Siberian oval. A second set of maps shows lines of equal declination, termed *isoclinic lines*. The *aclinic line*, or magnetic equator, connects places of no dip. At two points on the earth's surface the dipping needle stands vertical; these are the *magnetic poles*. The north magnetic pole was located by Sir John Ross, 1831, in Boothia Felix, lat. 70° 5′ N., long. 96° 33′ W.; the south magnetic pole was determined by Shackleton in 1909, at lat. 72° 25′ S., long. 155° 16′ E. A third set of maps exhibits lines of equal total magnetic force, termed *isodynamic lines*.

MAGNETISM, ANIMAL. See HYPNOTISM.

MAGNETITE, OR LOADSTONE, a ferrous mineral forming a natural magnet; black, opaque, and of metallic lustre; widely distributed, occurring in grains in such volcanic rocks as granite and dolerite.

MAGNETO. See AUTOMOBILE.

MAGNETOGRAPH, an instrument in use for recording variations in the values of the magnetic elements. The apparatus in all its forms consists essentially of a small mirror rigidly attached to a magnet that is free to move. A beam of light is thrown on the mirror and is reflected from it on to photographic paper wrapped round a drum which is rotated by clockwork at uniform speed. So long as the magnet remains perfectly still, a straight line is traced out on the paper by the spot of light; if the magnet moves ever so slightly the line becomes more or less curved according to the extent of the motion. The elements usually so recorded are the declination, the horizontal intensity, and the vertical intensity.

MAGNETO OPTICS, OR ELECTRO-MAGNETO OPTICS, the relation between electro-magnetism and light. Faraday, the first experimenter in this field, discovered in 1845 that the plane of polarization of a plane-polarized ray of light is rotated when the ray is passed through a substance placed in the field of a powerful electro-magnet. Subsequently Verdet found that the amount of rotation of the plane of polarization depends upon the material employed, the length of the material traversed, and the strength of the field, and determined for various substances the rotation produced by unit length of the material when placed in a field of unit intensity. This quantity is known as *Verdet's constant*. In 1877 Dr. Kerr observed that the plane of polarization is rotated when plane-polarized light is reflected from the pole of an electro-magnet, the direction of rotation being reversed when the polarity is reversed; and also that glass under electrostatic stress is strained and gives rise to double refraction like a crystal of Iceland spar.

As the result of an elaborate mathematical investigation Clerk Maxwell, 1867, concluded that optical and electro-magnetic phenomena are propagated in the same medium, and are in fact identical in character. Confirmation of this theory was supplied in 1888 by Hertz, who, in a remarkable series of experiments, showed that electro-magnetic waves travel with the same velocity and exhibit the same phenomena of reflection, refraction, and polarization as do those of light. Clerk Maxwell's theory is now generally accepted by physicists; and electro-magnetic phenomena, light, radiant heat, and X-rays are all classed as waves in the luminiferous ether, identical in character and properties and differing among themselves only in wave length.

MAGNETS, BAR. See BAR MAGNETS.

MAGNIFICAT, the song of thanksgiving of the Virgin Mary, incorporated in the evening service of the Anglican Church, to be said or sung after the First Lesson. Its use in the Church service dates back to about the 6th century.

MAGNIFYING GLASS. See OPTICS.

MAGNOLIA, a genus of plants of shrubby or tree-like habit, cultivated for their gorgeous flowers. The fruit consists of a group of follicles containing fleshy and brightly colored seeds.

MAGO (*d. c.* 203 B. C.), Carthaginian soldier *s.* of Hamilcar Barca fought under Hannibal.

MAGOG. See Gog and Magog.

MAGPIE, the familiar name of several species of *Pica*, a genus of passeriform birds belonging to the family Corvidæ *P. caudata*, the commonest species, is known all over Europe, and extends through the Palæarctic region; it can easily be tamed; *P. nuttalli*, a native of California, is distinguished by a bright yellow bill and a naked blue spot behind the eye.

MAGRUDER, JOHN BANKHEAD (1810-1871), a Confederate soldier *b.* in Winchester, Va. He graduated from the West Point Military Academy, in 1830, and saw active service in the Seminole and Mexican wars. Resigning from the U. S. Army at the outbreak of hostilities between North and South, he joined the Confederacy, taking command of the Confederate artillery at Richmond. The Confederate victory at Big Bethel, in 1861, was due to his leadership. With a force of only 12,000 men he successfully held the Peninsula against the Army of the Potomac in April, 1862. In 1863 he captured Galveston, Texas, from the Federals and broke the blockade. After the war he retired across the border into Mexico, where he served under Maximilian, until the capture of the latter, when he retired into private life at Houston, Texas.

MAGYARS. See Hungary.

MAHÀBHÀRATA, a sacred book of the Hindus, and one of the two great epics of ancient India, the other being *Ramayana*. It is probably the longest epic in the world, being about eight times as long as the *Iliad* and *Odyssey* together. The authorship has been ascribed to Vyása, but that is probably a generic name; it bears all the marks of being a compilation, for its contents are heterogeneous in the extreme. The leading story relates the contests between the Kurus, representing the spirit of evil, and the Pandus, representing the spirit of good. The temporary triumph of evil is shown by the adversities of the Pandus, while their ultimate renunciation of an earthly for a heavenly kingdom signifies the final victory of good. The text was first printed in 1834-39 in Calcutta.

MAHAFFY, JOHN PENTLAND 1839-1919), an Irish classical scholar, *b.* in Switzerland. He was educated in France and Germany, and afterwards at Trinity College, Dublin, where he became professor of ancient history. He has had many honors conferred upon him by various universities and learned societies. His chief publications are a translation of Kuno Fischer's *Commentary on Kant*, 1866; *Greek Social Life*, 1874; *Greek Antiquities*, 1876, now a standard schoolbook; *History of Classical Greek Literature*, 1880; *The Greek World Under Roman Sway*, 1890; *The Silver Age of the Greek World*, 1906. He also deciphered and edited the 'Petrie Papyri' in the *Cunningham Memoirs*, 1891-1905.

MAHAN, ALFRED THAYER (1840-1914), Amer. naval officer and historian; president of the Naval War Coll., 1886-89, 1892-93; member of Naval War Board during war with Spain, 1898; in 1906 was appointed rear-admiral (retired), and from 1908-12 was again on duty at the War College; author of important books on naval history; at once obtained renown with his book, *Influence of Sea Power upon History*, 1890. His other works include *Influence of Sea Power on French Revolution and Empire*, 1892; *Life of Nelson*, 1897; *Types of Naval Officers*, 1902; *Naval Administration and Warfare*, 1908; *Naval Strategy*, 1911, and *Armaments and Arbitration*, 1912.

MAHANADI (20° 17′ N., 86° 44′ E.), river, Brit. India flows by numerous mouths into the Bay of Bengal; length, 500 miles.

MAHANOY CITY, borough in Schuylkill co., Pa., about 55 miles northeast of Harrisburg and served by the Philadelphia and Reading and the Lehigh Valley Railroads. Its settlement dates back to 1859 and it was incorporated four years later. It is in the heart of the anthracite region and also has fire-clay deposits and building-stone quarries in the vicinity. Its chief industries are foundry products, hosiery, lumber, flour, and pottery, while it is an important coal shipping point. There are many handsome churches, good public and parochial schools, 3 banks and 2 newspapers. Pop. 15,559.

MAHATMA. See Buddhism.

MAHAVAMSA, chronicle in verse relating history of Ceylon from incarnation of Buddha to 301 A. D.; written by Hindu in V. cent. from Ceylon chronicles.

MAHDI, the expected Messiah of the Mohammedans, who should be a greater teacher than Mohammed, and under whose leadership the faithful would be led to conquer the world; first proclaimed by a Persian Shia named Abdulla, (10th cent.). From time to time Mohammedan fanatics have claimed to be the Mahdi, the most recent being Mohammed Ahmed, who made repeated efforts to conquer Sudan.

MAHÉ (11° 42′ N., 75° 34′ E.), seaport and Fr. settlement, Malabar coast, at mouth of Mahé, India. Pop. 10,000.

MAHMUD II (1785-1839), Sultan of Turkey succ., 1808; defeated Ali of Jannina, 1822; crushed Janissaries; reformed army, 1826; during Gk. struggle for independence, formed alliance with Mehemet Ali of Egypt; defeated by Powers at Navarino, compelled to recognize Gk. independence, 1829; rebelled against by Mehemet Ali, 1831, and lost Syria; compelled by France and Britain to recognize Mehemet Ali's claims, 1833; renewed war, 1839.

MAHMUD OF GHAZNI (971-1030), Afghan ruler and conqueror; gov. of Khorasan, 994; by defeating *bro.* Ismail, became sole ruler of Khorasan and Ghazni; reign marked by campaigns against India; most notable campaign, 1025, against Gujarat; took capital; career of conquest ended with expedition to Persia, 1029.

MAHOGANY, wood of *Swietenia mahagoni,* a tree of S. America and W. Indies; reddish-brown; takes an excellent polish; 'Spanish m.' (from Cuba) is most valuable.

MAHOMET, see MUHAMMAD.

MAHOMET, AHMED IBN SEYYID ABDULLAH, see MUHAMMAD, AHMED IBN SEYYID ABDULLAH.

MAHOMMEDAN INSTITUTIONS, see MUHAMMADAN INSTITUTIONS.

MAHOMMEDAN LAW, see MUHAMMADAN LAW.

MAHRATTAS, a warlike Hindu race inhabiting Maharashtra the northwestern district of the Deccan, a territory watered by the Nerbudda, Godavari, and Kistna. For a long time they kept up a struggle with Britain for the supremacy of India, but were finally defeated by Sir Arthur Wellesley at Assaye, in 1803, and the greater part of their lands became absorbed in British India.

MAIDEN, MAID.—(1) Unmarried girl (Lat. *virgo*); also used in such phrases as 'maiden speech,' which are traceable to original signification. (2) Instrument similar to guillotine; used in Scotland, XVI. and XVII. cent's.

MAIDENHEAD (51° 32′ N., 0° 42′ W.), market town, on Thames, Berkshire, England. Pop. 1921, 16,941.

MAIDSTONE (51° 17′ N., 0° 32′ E.), county town, Kent, on Medway, England; principal buildings are the church of All Saints; former coll. of All Saints and a XVI.-cent. manor house containing museum and library opened in 1858; breweries, paper- and oil-mills; Kentish Royalists defeated by Fairfax, 1648. Pop. 1921, 37,448.

MAIHAR (24° 16′ N., 80° 48′ E.), native state, Baghelkhand, Central India. Pop. *c.* 70,000.

MAIL COACHES. See COACHES.

MAIL ORDER BUSINESS. See ADVERTISING.

MAIL SERVICE, AIR. See AIR MAIL SERVICE.

MAIMANSINGH, a district in Bengal, India. It has an area of 6,287 sq. miles. It is fertile and well cultivated. The capital is Nasirapad.

MAIMON, SALOMON (1754-1800), Jewish philosopher; *b.* in Russia; work admired by Kant.

MAIMONIDES RABBI MOSES BEN MAIMON (1135-1204), Jewish theologian; lived in Spain, Africa, and Egypt; wrote commentary on *Talmud* and other works; revered by Jews as one of their greatest teachers.

MAIN, ancient *Moenus* (49° 50′ N., 8° 34′ E.), river, Germany; joins Rhine opposite Mainz; navigable to junction with Regnitz.

MAINA, OR MANI, modern Morea (37° 30′ N., 22° 10′ E.), mountainous peninsula in south part of the Peloponnesus, Greece, between Gulf of Koron and Kolokythia; the inhabitants, called Mainotes, claim to be descendants of the Spartans.

MAINE, extreme N. E. state of United States and of New England states (45° 55′ N., 69° W.), bounded N. and E. by New Brunswick, S. by the Atlantic Ocean, W. by New Hampshire and Quebec; coast much indented, giving coast-line of 2,500 m.; surface generally undulating, rising, towards center of state, to 5,300 ft. in Mt. Katahdin, a peak of Appalachian system; drained by Saco, Androscoggin, Kennebec, Penobscot, St. Croix, St. John, and other streams; contains great number of large lakes, including Moosehead, Sebago, Chesuncook, Schoodic, Allagash, Milinoket and others. Largest towns, Portland, Lewiston, Bangor, Biddeford; cap. Augusta. Climate is severe in winter and cool in summer. Maine became a separate state in 1820, when it was admitted as such to Union. A long-continued boundary dispute with Great Britain was settled by the Ashburton Treaty in 1842, whereby a compromise was arrived at. Recent history has been comparatively uneventful. Executive power invested in governor, who is

elected by popular vote for two years, and is assisted by an advisory council of seven members. Legislative power is vested in a senate of 31 members and house of representatives of 151 members, both elected for two years by popular vote. Maine is divided into sixteen counties for purposes of local administration, and is represented in Congress by two senators and four representatives.

Maine has large forests all over northern districts, producing timber, bark, maple sugar; agriculture is important industry, oats, corn, buckwheat, potatoes and hay being grown, and horses, cattle, sheep, and pigs raised. There are excellent fisheries, and fish canning is an important industry. Manufactures cottons, woolens, paper, flour, clothing, boots, leather, etc. Minerals are little worked, but there are some mineral springs, and granite is largely quarried. Railway mileage, 2,262. Education is free and obligatory; there is a state univ. at Orono; colleges at Brunswick, Lewiston, and Waterville. Inhabitants include whites, negroes, Asiatics; considerable Fr.-speaking element, including descendants of Acadian French and immigrants from Canada. Area, 33,040 sq. m., of which 3,145 sq. m. are water. Pop. 1920, 768,014 See MAP U. S.

MAINE (48° N., 0° 15′ W.), ancient province, France; capital, Le Mans; now included in modern departments Mayenne and Sarthe.

MAINE, ANNE LOUISE, DUCHESSE DE (1676-1753), *dau.* of Price de Condé; *m.*, 1692, duc de M., natural *s.* of Louis XIV.

MAINE, SIR HENRY JAMES SUMNER (1822-88), Eng. lawyer and historian; pub. *Ancient Law*, 1861; obtained new chair of Hist. and Comparative Jurisprudence at Oxford, 1869; member of council of Sec. of State for India, 1871; pub. *Village Communities*, 1871; *Early History of Institutions* 1875; *Early Law and Custom*, 1883; *Popular Government*, 1885; app. Whewell prof. of International Law at Cambridge, 1887.

MAINE, THE, an American battleship which was sunk by an explosion in the harbor of Havana, Cuba, February 15, 1898, with a loss of 258 men. This event contributed largely to the declaration of war with Spain, although the cause of the explosion was never finally determined.

MAINE, UNIVERSITY OF, a coeducational institution founded by the State in Orono, in 1862. In 1921-22 there were 1,232 students, of whom 605 were enrolled in the department of Arts and Sciences, 532 in the department of technology and 294 in the agricultural department. The faculty numbered 107. It has a library containing 70,000 volumes.

MAINE DE BIRAN, FRANÇOIS PIERRE GONTHIER (1766-1824), Fr. philosopher; treasurer of chamber of deputies under Louis XVIII., but devoted himself largely to psychology; elaborated a theory of consciousness.

MAINE-ET-LOIRE (47° 25′ N., 0° 30′ W.), department, W. France; formed part of ancient Anjou; surface hilly; traversed by Loire and its tributary, the Maine; soil, generally fertile, produces grain, flax, hemp, wine, fruits; linen, cotton, and woolen manufactures; capital, Angers. Pop. 510,000.

MAINPURI (27° 14′ N., 79° 3′ E.),; town, capital, Mainpuri, United Provinces, India. Pop. 20,000.

MAINTENON, FRANÇOISE D'AUBIGNÉ, MARQUISE DE (1635-1719), second wife of Louis XIV. of France; *m.* the poet Scarron, 1651, and was head of literary *salon* till his death, 1660; became governess to children of king by Madame de Montespan; cr. marquise, 1678; *m.* king, 1685-86; founded St. Cyr.

MAINZ, OR MAYENCE, fort. tn., republic of Hesse, Germany (50° N., 8° 16′ E.), on Rhine, below influx of Main; busy river port; fine old cathedral, museums, electoral palace (with Roman antiquities), conserves, machinery, furniture, leather; headquarters of Rhenish wine trade; lithographic and printing industries. Mainz was an imperial free city until 1462; birthplace of Gutenberg, who invented movable type. Pop. 118,000.

MAIRE LE, STRAITS OF, a narrow channel between Terre del Fuego and Staten Island. It was discovered by the Dutch in 1616.

MAISONNEUVE, a city of Quebec, Canada, a suburb of Montreal. Pop. about 40,000.

MAISTRE, JOSEPH DE (1754-1821), Fr. author and politician; *b.* Chambéry; went as envoy to St. Petersburg, 1802; wrote various political and ecclesiastical works, the most famous, *Du Pape*, pub. 1817.

MAITLAND, FREDERICK, WILLIAM (1850-1906), Eng. historian; Downing prof. of Laws of England, Cambridge, from 1888; wrote numerous hist. and legal works.

MAITLAND, SIR RICHARD, LORD LETHINGTON (1496-1586), Scot. law-

yer, poet, antiquary, and historian; his poems were pub. by the Bannatyne Club, 1830. *A Historie and Cronicle of the Hous and Surename of Seytoun* is his chief hist. work.

MAITLAND OF LETHINGTON, WILLIAM (*c.* 1528-73), chief Scot. statesman of time of Mary, Queen of Scots; subtle in intellect and character; share in crimes of time morally certain but never proved.

MAIZE (*Zea Mays*), native name of Indian corn; a gramineous plant indigenous to Mexico, but now cultivated extensively, especially in America and S. Africa. The plant differs considerably from typical grasses in its inflorescence, the florets of which are unisexual. The staminate flowers are massed apically, whilst the pistillate ones form a dense aggregate known as a 'cob,' with the long filamentous stigmas hanging from the top. The whole cob is protected when young by large sheathing bracts. See CORN, INDIAN.

MAJOR, in music, greater. A major third consists of four semitones, a minor third of three. A major tone is the whole tone, having the ratio 8:9; a minor tone that having the ratio 9:10. Intervals have had the term major applied to them in a conflicting manner.

MAJOR, a military officer, ranking next above a captain, and below a lieutenant-colonel. He commands in the absence of the lieutenant-colonel and colonel.

MAJOR, CHARLES (1856-1913), an American novelist, *b.* in Indianapolis, Ind. He practiced law for many years and in 1898 wrote *When Knighthood was in Flower*, which achieved great success. This was followed by *Dorothy Vernon of Haddon Hall*, and other novels.

MAJORCA (39° 35′ N., 3° E.)-largest of the Balearic Islands, Mediterranean Sea; mountainous in N. W.; soil very fertile; produces cereals, wine, olive oil, fruit; chief occupations, agriculture and cattle-rearing; cotton, woolen and silk industries; capital, Palma. Pop. 250,000.

MAJORITY (1) That age at which a person becomes *sui juris* (*i.e.*) legally old enough to manage his own affairs. By English and American law an infant attains his M. at twenty-one. (2) Ruled by M., or the decision of any issue by the votes of the M. is the working principle of the democratic idea of representation. It has up to now been generally considered to be the only practicable method of party government, but the advocates of proportional representation and representation of minorities are gaining increased support the more it is realized both that the mere voice of the M. is not necessarily right, and that whether it be so or not on particular issues, the views of minorities may none the less be entitled to respectful consideration.

MAJUBA (27° 30′ S., 30° E.), hill, Drakensberg range, N. Natal; scene of British defeat by Boers, Feb. 27, 1881.

MAKAROFF, STEPAN OSIPOVICH (1848-1904), a Russian admiral who served in the Russo-Turkish War, and from 1891 to 1894 was admiral and inspector-in-chief of naval artillery. He commanded the Russian fleet at Port Arthur in the Russo-Japanese War and perished in the blowing up of the battleship *Petro Pavlosk.*

MAKART, HANS (1840-84), Austrian painter; prof. at Vienna Academy; produced chiefly spectacular and hist. genre pictures, highly colored and of great size.

MAKÖ (46° 11′ N., 20° 28′ E.), town, Csanád, Hungary, on Maros; several mills. Pop. 35,000.

MALABAR (11° N., 76° E.), district, Madras Presidency, India, sloping from W. Ghats to Indian Ocean; has extensive forests of teak; produces rice, coffee, cocoanuts; chief towns, Calicut, Tellicheri, Cochin; name is applied to whole S. W. coast of S. India.

MALACCA (2° 14′ N., 102° 13′ E.), town, Malay Peninsula; has harbor and is free port; exports tapioca, rice, spices; settled by Portuguese in 1511, remaining in their possession till 1641, when taken by Dutch; occupied by Brit., 1795-1818; when Dutch regained possession; finally returned to Brit. in exchange for Benkulen, 1824. Pop. *c.* 100,000.

MALACCA BEAN, fruit of the marking-nut tree of India.

MALACCA, STRAIT OF, a channel between the Malay Peninsula and the island of Sumatra. It is about 520 miles long and from 20 to 200 miles wide.

MALACHI, Old Testament book, last of 'Minor Prophets;' no records exist of M. himself. The book was written about the time of the return from Exile, either about 458 B. C., when Ezra arrived, or 432, when Nehemiah came. The same abuses of intermarriage and general remissness of the people are denounced. Though the author believes in ritual observance he is none the less a prophet. The tone of the book is gloomy.

MALACHITE, carbonate of copper ore; of dark green color; laminated, fibrous, and massive. The finest m. is

found in Siberia and Russia; m. also found in Australia, in nearly all copper mines. Used for ornamental purposes, mosaic, cameos, and for making pigment.

MALACHY, ST. (1094-1148), Irish ecclesiastic; studied at Rome and worked for Romanization of Celtic Church abp. of Armagh, 1139; friend of St. Bernard; canonized, 1190. Some books are falsely ascribed to him.

MALACOSTRACA (Gk. *malakos*, supple; *ostrakon*, a shell).—The largest and most familiar of Crustaceans, crabs, lobsters, prawns, etc., are grouped in this great class. They differ much in shape and size, from the tiny half-inch 'Sand-Hoppers' of the shore, and the pin-head *Nebalia*, to the Giant Crab of Japan (*Macrocheira*), with a span of sometimes more than 10 feet, yet they have this in common, that all possess a definite number (19 pairs) of appendages, definitely arranged—5 pairs on the head, 8 pairs on the thorax, and 6 pairs on the abdomen. In addition there is often a gizzard—the gastric mill.

MALAGA.—(1) (37° N., 4° 40′ W.) province, S. Spain, on Mediterranean; mountainous; rich in minerals; fertile and well cultivated. Pop. 1910, 523,-429. (2) (36° 45′ N., 4° 27′ W.) seaport town, capital of above; chief buildings are cathedral, episcopal palace, hospitals, theatre, bull-ring; exports iron, lead, wine, olive oil, fruit; manufactures cotton, linen, machinery, pottery; taken by the Moors in 711; besieged and taken by Ferdinand in 1487. Pop. 135,000.

MALAGA WINE is produced chiefly from the Axarquia dist. of Malaga, and the finest is made from the muscatel grapes, *Dulce* and *Lagrimas* being the best-known vintages.

MALAR (59° 30′ N., 17° E.), lake, Sweden, stretching inland from the Baltic at Stockholm; contains over 1,200 islands; length, 80 miles.

MALARIA (also called Ague and Miasma), a disease characterized by intermittent paroxysms of fever. It is caused by a parasite which inhabits the red blood corpuscles; part of its life cycle is spent in man and part in the mosquito, so that man may be infected by the bite of an infected mosquito and a healthy mosquito may be infected by biting an infected man. As male mosquitoes are vegetarians, only the females convey the disease. About thirty varieties of mosquito, chiefly *Anopheles*, are known to carry the parasite. Three types of the parasite attack man. These are *Plasmodium vivax*, *P. malariæ*, and *P. falciparum*, the cause of *tertian malaria*, *quartan malaria*, and *æstivo-autumnal fever* respectively. Marshy soil and high temp. and humidity favor the development of the mosquito and the consequent incidence of the disease. It occurs in tropical countries, and almost all countries of temperate zone.

Methods for prevention of the disease include the use of mosquito nets over beds, windows, doors, and verandas; marshy country should, if possible, be drained—petroleum used to form a film over pools where mosquitoes breed; and all streams should be kept clean and free from weeds.

Opinion varies concerning the prophylactic use of quinine. In the treatment of the actual attacks the bowels must be freely moved, and large doses of quinine must be administered. Smaller doses may be continued for some weeks after an attack. If administration by the mouth is ineffective, quinine may be injected into the muscles; but in the more urgent cases, such as malarial coma, large doses of quinine injected into a vein give the best hope of recovery, which often occurs with suddenness.

MALATIA (38° 27′ N., 38° 27′ E.), town, ancient *Melitene*, Asiatic Turkey, near Euphrates; chief industry, fruit culture; produces opium; has Prot. and R. C. missions. Pop. 61,000.

MALAY ARCHIPELAGO (20° N. to 10° S., 95° to 150° E.), islands between S. E. Asia and N. Australia. One of greatest strata of volcanic rocks in the world passes through the archipelago, which is crossed by two curving lines of active and extinct volcanoes, the region being subject to frequent earthquakes. The Western islands, Sumatra, Java, Borneo, and a number of groups of smaller islands, have a close physical resemblance to Asia, which points to the conclusion that at a comparatively recent geological period they formed part of that continent; while the Eastern islands, from Celebes outwards, exhibit an equally close resemblance to Australia. The contrast between Asiatic and Australian flora and fauna is nowhere so sudden as in the adjacent islands of Bali and Lombock, which are only 15 miles apart.

Dutch East Indies include Java and Madura, Sumatra, Celebes, parts of Borneo and New Guinea, Rian Linga Archipelago, Timor Archipelago, Moluccas, Banca, Billiton, Bali, and Lombock; total area, *c.* 736,400 sq. miles.

European knowledge of M. A. dates from 1509, when Sumatra was reached by Portuguese explorer, Lopez de Sequeira. During XVI. cent. Portugal and Spain established spheres of influence here; later on, Dutch and English also appeared upon the scene; former

gradually extended their territories and became principal power in archipelago by 1674. For a few years in early XIX cent. British seized several of the islands, but Dutch regained chief control in 1816, and now hold practically whole archipelago except Philippines.

Administration is conducted by governor-general, who is appointed by Crown, and assisted by an advisory and legislative council. There is complete religious liberty, and education is controlled by government. Principal products are rice, c r l, cotton, arachis, sugar-cane, tobacco, indigo, coffee, tea, cinchona. Minerals found are coal, tin petroleum. Inhabitants are of Malay and Papuan stocks; foreign inhabitants include Europeans, Chinese, Arabs, and other Orientals. Pop. *c.* 46,000,000. See MAP EAST INDIA ISLANDS.

MALAY PENINSULA (1° 15′ to 10° 5′ N., 98° 15′ to 104° 7′ E.), a long narrow projection extending from Indo-China southward towards Sumatra, and forming extreme S. of mainland of Asia. Properly it extends from head of Gulf of Siam, with length of *c.* 900 miles; width, 45 to 210; area, *c.* 75,000 sq. miles, of which over 35,000 are British. Whole peninsula is traversed by mountain chain, which reaches height of 7,000 to 8,000 ft.; watered by Perak, Pahang, Kelantan, and other rivers. Northern part belongs to Britain on W. coast, to Siam on E.; center is Siamese as far S. as 4° on E. and 5° 30′ on W.; in S. are British territories and protected states. Inhabitants include Malays, Chinese, Siamese, Eurasians. Climate is hot and damp. Central mountains are one of great tin-producing districts of world; gold, silver, coal, iron also found. There are magnificent forests—ebony, camphor, teak, sandal-wood, palms, bamboo; produces sago, tapioca, rubber, nutmegs, tea, coffee, pepper. See MAP, CENTRAL AND SOUTHERN ASIA.

MALAY STATES, under Brit. protection and comprising a large portion of the Malay Peninsula (4° N., 102° E.), include the federated states of Pahang, Perak, Selangor and Negri Sembilan, and the non-federated states of Kedah, Kelantan, Perlis, and Trengganu; while Johor, in extreme S. of peninsula, has its foreign relations controlled by Britain. Surface generally flat along coast, hilly inland, as the mountain range that traverses whole peninsula passes down to W. of center. The federated states were united under federal administration by treaty with Great Britain in 1896. Federal cap. Kuala Lumpur, in Selangor. Total area, 27,506 sq. m.; pop. 1,037,000.

Pahang, situated in E.; drained by Pahang and other rivers; cap. Pekan; produces tin, gold, lead, fish; under Brit. protection since 1888. Area, 14,000 sq. m.; pop. 118,700.

Perak, in N. W.; drained by Perak and other streams; cap. Taiping; produces tin, sugar, rice, rubber, copra, ramie; under Brit. protection since 1874. Area, 7,800 sq. m.; pop. 494,100.

Selangor, to south of Perak; drained by Salangor and other rivers; cap. Kuala Lumpur; produces tin, coffee, rice, pepper, rubber; under Brit. protection since 1874. Area, 3,156 sq. m.; pop. 294,000.

Negri Sembilan, S. W. of Selangor; cap. Seremban; produces tin, gold, coffee, tapioca, rice, gambier; comprises number of native states, confederated under present name in 1889; whole under Brit. protection since 1895. Area, 2,550 sq. m.; pop. 130,200.

The non-federated states came under Brit. protection by treaty with Siam in 1909; total area, 15,986 sq. m.; pop. 719,300.

Kedah, in W.; drained by Kedah; cap., Alor Star; produces rice, rubber, tapioca, coconuts. Area, 3,800 sq. m.; pop. 245,900.

Kelantan, in E.; drained by Kelantan; cap. Kota Bharu; produces tin, gold, pyrites, galena, rice, coconuts, rubber, tapioca, sugar; livestock raised. Area, 5,870 sq. m.; pop. 286,700.

Perlis, N. of Kedah; drained by Perlis; cap. Perlis; produces rice, tin, guano. Area, 316 sq. m.; pop. 32,700.

Trengganu, in E., drained by Trengganu and other streams; cap. Kuala Trengganu; produces fish, tin, pepper, copra. Area, 6,000 sq. m.; pop. 154,000. See Map CENTRAL AND SOUTHERN ASIA.

MALAY STATES, SIAMESE (*c.* 5° 35′ to 7° 30′ N., 99° 30′ to 102° E.), native states of Malay Penninsula, under Siamese protection, but ruled by their own rajahs; include Patani on E., which consists of seven small states. Palean on W., and Setul, S. of Palean; area, *c.* 6,900 sq. miles. Pop. *c.* 380,000. See Map CENTRAL AND SOUTHERN ASIA.

MALAYS, race inhabiting the Malay Archipelago and Peninsula, Polynesia; Philippine Islands, and Madagascar. They are brown in color, short of stature, and have high cheek-bones and oblique y set eyes. The pure Malays are a quiet race of traders and sailors, mostly Mohammedans in religion, who at one time attained a very high degree of civilization, inventing gunpowder and the art of writing for themselves. The M. commonly live on the banks of rivers, in houses raised on piles some feet from the ground. Rice is the staple food and

chief product of agriculture, but corn, tapioca, and sugar-cane are also cultivated. Cotton and silk cloths, mats, earthenware and silverware are the chief industries. Many of the M. were formerly pirates hence their character for ferocity. Today they are by no means warlike, but are strictly aristocratic—loyal to their chiefs—and a courteous people.

MALCOLM I. (MACDONALD) (*d.* 954), King of Scotland, succeeded to the crown in 943. He made a treaty with Edmund the W. Saxon king in 945, and renewed it with his successor, Eadred, but in 950 the Scots made a foray to the Tees. They were, however, unable to stay the progress of the W. Saxons, and in 954 Northumbria was lost and M. slain.

MALCOLM II. ACKENNETH) (*d.* 1034), King of Scotland, son of Kenneth II., succeeded in 1005 by defeating and killing Kenneth III. In 1018 he won a great victory over Eadulf Cudel, which led to the cession of Lothian to the Scottish kingdom, and about the same time Cumbria N. of the Solway became an appanage of the kingdom. In 1031 M. did homage to Canute.

MALCOLM III., CANMORE, Scot. king (1053-93); *m.* Margaret, sister of Edgar Atheling, on whose behalf he twice, 1070 and 1091, invaded England; became vassal to William Rufus; slain at Alnwick.

MALCOLM IV. (1141-65) (the Maiden), King of Scotland, succeeded his grandfather, David I., in 1153. He surrendered Northumberland and Cumberland to Henry II. in 1157, and received in return Huntingdon. He served as an English baron in the expedition against Toulouse, 1159, and as a result was engaged in suppressing rebellions in Scotland, 1160-64.

MALCOLM, SIR JOHN (1769-1833), Brit. soldier, ambassador, and author; distinguished at siege of Seringapatam, 1799; ambassador to Persia, 1800, 1807, 1810; gov. of Mysore Residency, 1803; gov. of Bombay, 1827-30.

MALDA (25° 3′ N., 89° 11′ E.), district, Bengal, India, on Mahanada, near Ganges; silk and indigo industries. Pop. 886,000.

MALDEN, city of Middlesex co., Mass., located on the Malden River and served by the Boston and Maine railroad, besides a network of electrical railways that connect it with Boston, Lynn, Salem, Haverhill, Lowell and a number of other important industrial centers. It was incorporated as a city in 1881, though its settlement dates back to 1641. It has very large manufacturing industries, of which the leading ones are boots and shoes, leather, cotton goods, hosiery, knit goods, furniture, soap and wire cord. It has an excellent water system, fine schools, handsome churches, 5 libraries, 4 banks, 3 newspapers, a city hospital and a Home for the Aged. The government is in the hands of a mayor and council, the first of whom appoints administrative officials subject to the approval of the council. Pop. 1920, 49,103.

MALDEN, an island in the S. Pacific, which has an active trade in guano. It was taken possession of in the name of the Queen of Great Britain in 1864.

MALDIVE ISLANDS (4° N., 72° E.), chain of 17 coral islands in Indian Ocean, S. W. of Ceylon; chief products, coir, cowries, and cocoanuts; natives are Mohammedans; ruled by a sultan and tributary to the government of Ceylon; capital, Mali. Pop. 50,000.

MALEBRANCHE, NICOLAS (1638-1715), Fr. philosopher; at first studied theol., becoming a priest of the Oratory, then deeply affected by work of Descartes M. maintained that we see all things in God., in whom all beings and thoughts exist, just as material things exist in space; God is also the real direct cause of all changes.

MALER KOTLA (30° 31′ N., 75° 59′ E.), native state, Punjab, India. Pop. 78,000.

MALESHERBES, CRETIEN GUILLAUME DE LAMOIGNON DE (1721-94), Fr. statesman; minister of the *maison du roi*, 1775, and introduced reforms; encouraged lit. and science, and helped to establish the *Encyclopedie*; pleaded for king in Convention of 1792; guillotined.

MALHERBE, FRANÇOIS DE (1555-1628), Fr. poet and critic; wrote verses from about 1584, but is chiefly known for his reform of the Fr. language and versification; called 'The tyrant of words and syllables;' to him Romantic school of XIX. cent. ascribed arrest of poetic production, as he introduced correctness which marked Classical school of XVII. cent.

MALIBRAN, MME. (1808-36), Span. contralto operatic singer.

MALIC ACID or **MONOHYDROXY-SUCCINIC ACID** ($C_4H_6O_5$), an organic acid which occurs in the free state and in the form of its salts in many fruits, including apples, grapes, and mountain-ash berries. It forms deliquescent crystals melting at 100° C.; it dissolves readily in water and alcohol. It may be prepared by boiling bromosuccinic acid with silver hydroxide and water,

or by treating aspartic acid with nitrous acid. It is usually obtained by squeezing the juice out of unripe mountain-ash berries; the juice is boiled with milk of lime, and the resulting precipitate is dissolved with hot nitric acid, crystals of calcium hydrogen malate being formed. The salt is then decomposed with oxalic acid.

MALICE, in popular language means ill-will or spite against a particular person or class of persons. In law it occasionally has this meaning, as, (*e.g.*) in the case of an action for malicious prosecution (*q.v.*), and, again, in the law of libel the defense of 'qualified privilege' is rebuttable by proof of such m. in the defendant.

MALINES, OR MECHLIN, city, Antwerp, Belgium (51° 2′ N., 4° 28′ E.), on Dyle; seat of the cardinal-primate of Belgium; it manufactures furniture, linen, and woolen goods; 'Gobelin' tapestry; formerly famous for lace; central point of Belgian railway system; extensive railway works. During the World War, was entered by the Germans, Aug. 23, 1914, who were twice driven out by Belgian sallies from Antwerp. Germans bombarded the town and destroyed the magnificent cathedral, 14th cent., and town hall. Pop. 59,700.

MALLARD, OR WILD DUCK. See DUCK FAMILY.

MALLEABILITY, that property of a metal by virtue of which it can be hammered or rolled out in a thin sheet. It forms with ductility the more general property of plasticity, but the most malleable metals are not by any means the most ductile; lead, for instance, may be beaten into a very thin sheet, but cannot be drawn out into a fine wire. The property of M. varies with temperature, and the introduction of foreign substances, but of the ordinary metals, lead by hammering, and gold by rolling can be reduced to the thinnest sheets.

MALLECO (38° S., 72° 30′ W.), province, S. Chile, S. America; capital, Angol. Pop. 115,000.

MALLOCK, WILLIAM HURRELL (1849-1923), Eng. author of religious, philosophical, and social questions, also several novels. Among his works are *The New Republic*, 1877; *The New Paul and Virginia*, 1878; *The Reconstruction of Belief*, 1905; *Social Reform*, 1914; *Memoirs of Life and Literature*, 1920

MALLOW (*Malva*), herb with pinnatifid hairy leaves and pentamerous flower, characterized by five much-divided stamens which cohere by filaments.

MALMAISON, a chateau in dept. of Seine, France, 5 m. W. of Paris. Noted as having been the residence of the Empress Josephine after her divorce from Napoleon.

MALMÉDY, tn. Liége, Belgium (50° 26′ N., 6° 2′ E.); tanning, dyeing, papermaking. Pop. 4,700. District ceded to Prussia, 1814-15; became Ger. military base; large camp at Elsenhorn and various strategic lines directed against Belgium. By Art. 34 of Treaty of Versailles, Germany cedes districts (*Kreise*) of Eupen and Malmédy to Belgium, subject to the proviso that they should revert to Germany if inhabitants express in writing their desire to do so during the first six months after treaty comes into force. In accordance with this art. the Belgians opened registers to ascertain views of inhabitants; number of dissenters remarkably few, and Council of League of Nations, Sept., 1920, recognized transfer as definitive, and declared Ger. protests unfounded.

MALMESBURY (51° 35′ N., 2° 6′ W.), market town, on Avon, Wiltshire, England; has remains of a VII.-cent. Benedictine abbey; breweries; silk and pillow lace; birthplace of Thomas Hobbes.

MALMESBURY, JAMES HARRIS, 1ST EARL OF (1746-1820), Brit. diplomatist; successively ambassador to Spain, Prussia, Russia, Holland.

MALMESBURY, WILLIAM (*c.* 1095-1143), an Anglo-Norman chronicler, became a monk in the monastery at Malmesbury, and later librarian and precentor. His *Gesta Regum Anglorum*, gives the history of the kings of England from the Saxon invasion to 1128. He also wrote *Gesta Pontificum Anglorum*, 1125 (revised 1135-40); *De Antiquitate Glastoniensis Ecclesiae*; *Historia Novella* (a sequel to the *Gesta Regum*); an account of the church at Glastonbury; and a *Life of St. Dunstan.*

MALMÖ (55° 35′ N., 13° 1′ E.), seaport, Malmöhus, Sweden, on the Sound; ironworks; cotton and woolen industries. Pop. 90,000.

MALMSEY, a sweet and luscious white wine, originally brought from Malvasia or Malvoisie in the Morea, and hence sometimes known as Malvoisie. Vines of this variety were planted in Teneriffe, Madeira, and the Canary Islands, and Malmsey wine used to be made from the grape grown on the rocky ground of Madeira.

MALOLOS (14° 50′ N., 121° E.), town, capital, Bulacon, Luzon, Philippine Islands; rice. Pop. 12,500.

MALONE, village, county seat of

Franklin co., N. Y., about 12 miles south of the Canadian boundary. It is the center of an agricultural region and is the natural market and shipping point for the district's poultry, hay, hops, potatoes and dairy products. It has many industrial establishments, chief of which are those for making paper, pulp leather, lumber, clothing, cigars, foundry products and leather goods. It has six churches, three public libraries, two national banks, three newspapers and excellent high, primary and grammar schools. It has many large and handsome buildings, including a federal post-office and custom building, county court-house and State armory. Its proximity to the Canadian border has made it twice the scene of Fenian gatherings. The waterworks are municipally owned. Pop. 1920, 7,556.

MALONE, EDMUND (1741-1812), Irish Shakespearean scholar and edit.; his *Variorum Shakespeare*, ed. by James Boswell the younger, and pub. in 21 vol's, 1821, is valuable.

MALONIC ACID, $CH_2(COOH)_2$, M.P. 132; crystallizes in plates; soluble in water and in alcohol; it occurs as $(CH_2COO)_2Ca,2H_2O$ in beetroot. First obtained by oxidizing malic acid; whence name.

MALORY, SIR THOMAS (fl. 1470), Eng. translator; was, as we learn from Caxton's preface to his great work the *Morte d'Arthur*, a knight, translated his book from Fr. sources, and completed it in the 9th year of Edward IV.'s reign. The work is a magnificent prose epic of Fr. romance.

MALOT, HECTOR HENRI (1830-1907), a French novelist. For many years he resided in London as newspaper correspondent. He wrote many novels, the best known of which is *L'Roman de mes Romans*.

MALPIGHI, MARCELLO (1628-94), Ital. anatomist and physiologist, studied philosophy and med. at Bologna, and lectured on med. at Bologna, 1656; Pisa, 1656; Messina, 1662, and again at Bologna, 1666, for twenty-five years, retiring three years before his death to become private physician to Pope Innocent XII.; the founder of the science of histology.

MALPLAQUET (50° 20′ N., 3° 50′ E.), village, Nord, France, on Belgian border; here in 1709, during War of Span. Succession, French under Villars and Boufflers were defeated by combined Brit. and Ger. forces under Marlborough and Prince Eugene; 30,000 slain.

MALTA, isl. in Mediterranean, S. of Sicily (35° 53′ N., 14° 27′ E.); it is about 58 m. from Sicily and 180 from nearest point of Africa; E. and N. E. coasts are broken with good inlets; along S., cliffs are *c.* 400 ft. high, and highest point of island is *c.* 800 ft. It is a Brit. crown colony and principal Brit. naval station in Mediterranean, and as such is strongly fortified; during World War it was an important concentration base for troops engaged in the Eastern theatres, and had extensive hospital accommodation; center of trade and port of call is Valetta, the cap., which is an important coaling station, and contains church of St. John and many splendid palaces of the Knights. Old cap., Citta Vecchia, has cathedral and catacombs. Climate mild and healthy.

Malta belonged in early times to Phœnicians, Greeks, Carthaginians, and Romans in succession; is said to have been converted to Christianity after St. Paul was shipwrecked on it (A. D. 58); formed part of Byzantine empire after separation of East and West; it was occupied by Vandals in 5th and 6th cents., and was taken in 870 by Arabs, who were eventually expelled by Count Roger, the Norman ruler of Sicily, in 1090; as part of Sicilian dominions Malta was held in turn by Hohenstaufens, Angevines, and Aragonese, and, having come to hands of Charles V., was granted by him to the Knights Hospitallers in 1530. It was unsuccessfully attacked by Turks in 1551, and again in 1565, when it was besieged for nearly four months by a Turk. fleet sent by Suliman II.

In 1566 Valetta was founded, and in 1571 the Knights were present at battle of Lepanto. They held the island until 1798, when it was taken by Napoleon on his way to Egypt; Knights were banished, and large number of captive Turks set free. Few months later, Maltese rose in rebellion against the French; they were supported by England and Naples, and after two years compelled French to surrender to British under Pigot. By Treaty of Amiens in 1802 it was arranged that the Knights should be reinstated; but as Maltese preferred Brit. control, Britain retained possession, and in 1814 Malta was recognized by Treaty of Paris as part of Brit. Empire.

Malta is administered by governor. Inhabitants include English, Italians, native Maltese. About half island is under cultivation; produces cotton, potatoes, fruits, onions, cereals, honey; cattle, sheep, and goats reared. Manufactures lace, filigree, pottery. Has 8 m. of railway. Area, 91 sq. m.; with Gozo and Comino, 117 sq. m.; pop. 228,500.

See MAP, EUROPE.

MALTA, KNIGHTS OF. See HOSPITALLERS.

MALTA, OR MEDITERRANEAN FEVER, infectious disease, due to a specific micrococcus, characterized by, at first, headache, insomnia, constipation, and profuse perspiration, with enlargement of the spleen. Later the acute symptoms pass off, but the disease follows a prolonged and irregular course, often with arthritis or other complications.

MALTE-BRUN, VICTOR ADOLPHE (1816-89), a French geographer, *s.* of Conrad. He was professor of history at Pamiers, 1838, and at various colleges. In 1847 he took up geographical studies, and became general secretary of the Société Géographique in Paris. He published a new edition of his father's *Geographie*, 1852-55, wrote *La France Illustree*, 1855-57, and was chief editor of *Nouvelles Annales des Voyages*.

MALTESE CROSS, See CROSS.

MALTHUS, THOMAS ROBERT (1766-1834), Eng. economist; was ed. at Cambridge, becoming Fellow of Jesus College; ordained, 1797; famous for his *Essay on the Principle of Population*, 1798. This work has often been regarded as one of the greatest contributions to economic science. Economists now regard M.'s chief proposition (that population tends to increase faster than the means of subsistence) as really original.

MALTING. See BREWING.

MALTOSE. $C_{12}H_{22}O_{11}$. A sugar belonging to the group of disaccharides, formed, together with dextrin, by action of malt on starch. It occurs in the leaves of plants and in germinating seeds, and, under abnormal conditions, in urine. It was probably prepared by several chemists in the early part of the 19th cent., but it was not recognized and named until 1847, when Dubrunfout classified it as a tri-saccharide and named it maltose. In 1872, O'Sullivan showed that it was a di-saccharide. It may be prepared by heating starch with four times its weight of water, until a paste is produced, which is then cooled to 60° C. Sixty grains of malt are added and the mixture is maintained at 60° C. for at least an hour. The diastase in the malt acts upon the starch producing dextrin and malt. The mixture is heated to boiling, filtered, and the solution evaporated. Pure maltose crystallizes in needles containing one molecule of water of crystallization, but commercial maltose usually occurs as a thick syrup. It is very soluble in water, reduces Fehling's solution, and is dextrorotatory. It ferments readily with the formation of alcohol, but before fermentation it is hydrolyzed to dextrose by maltase, a ferment present in most yeasts. On boiling with dilute acids, it is hydrolyzed to glucose.

MALVACEÆ, a large natural order of herbs, shrubs, and trees most numerous in the tropics. They are all free from unwholesome qualities, and contain a quantity of mucilage, which is extracted by boiling from certain species and is used medicinally. The most important genus of the order is *Gossypium*, to which belong the cotton-producing plants.

MALVERN (52° 7′ N., 2° 19′ W.), watering-place, near Malvern Hills, Worcestershire, England; comprises town of Great M. and several villages; has a priory church, a coll., and several hydropathic establishments; mineral springs. Pop. of district. 18,000.

MALWA (24° N., 75° E.), province of India, N. of the Vindhya Mountains; contains Bhopal, Indore, Dhar, and other native states; chief products, opium. Pop. *c.* 1,110,000.

MAMARONECK, town in Westchester co., N. Y., 11 miles east of New York City limits and 21 miles from the heart of the metropolis. It is served by the New York, New Haven and Hartford railroad. While there are some industrial establishments engaged in the production of sewing machines, rubber goods and gutta percha, it is largely a place of residence for those whose business interests are in New York City. Part of the village of Larchmont is included in the town of Mamaroneck. There are good schools, churches, 2 banks and 3 newspapers. The town is located on Long Island Sound and is the headquarters of the Larchmont Yacht Club. Pop. 1920, 6,571.

MAMMALS, MAMMALIA (Lat. *mammæ*, 'breasts'), the class of animals to which man himself belongs, and which, on account of the unified complexity of the structures of its members, stands, with Birds, at the top of the Vertebrate stock. The old name Quadrupeds as applied to Mammals, is insufficient, since Whales (which are Mammals) have no limbs at all, whereas many Reptiles are 'quadruped.'

The most characteristic feature of Mammals is that which gives them their name—the presence in the female of mammary glands which secrete milk for the nourishment of the young. These

milk glands may open simply on a bare hollow patch of skin from which the young lick the milk, as in Echidna, or they may be associated with raised mammæ or teats, by which the offspring is suckled. Other characters are distinctive of Mammals. They of all animals alone possess hair, even if in some it be reduced to a few bristles on the lips (see HAIR). The brain is very highly organized; and the body is separated by the diaphragm or midriff into two distinct cavities, the upper containing heart and lungs, the lower the digestive apparatus. In the skeleton the lower jaw hinges directly on the skull, and each half is composed of only a single bone; the vetebral centra have flat or slightly rounded surfaces, and there are usually only seven vertebra in the neck.

Mammals are predominantly land animals, although Bats have conquered the air, and Whales and their relatives the sea. Their habits are exceedingly diverse: many are vegetarians, the diet of some is confined to insects and small life, but perhaps the majority are carnivorous. The first feed mainly by day, but the remainder are as a rule nocturnal prowlers, often living in clans and hunting in packs. The males of mammals woo characteristically by force, and accordingly adaptations for combat are plentifully diverse, but the care exercised over their offspring is an outstanding feature, and to this the success of the class may be in great part due.

Mammals are indispensable to man, for from them he obtains most of his food and raiment, and their adaptibility to domestication has lightened his labor through all the ages.

The Class Mammalia falls into three lines of evolution:—

Sub-Class I. Prototheria, Ornithodelphia or Monotremata.—Primitive Mammals which lay large eggs, from which the young hatch: in which there are no mammæ, the mammary pores simply opening on a bare patch of skin, and no placenta; with a common vestibule into which both rectum and urogenital canal open; testes in abdomen; having a fluctuating blood temperature of only from 25° to 28° C., and a comparatively poorly developed brain. Examples—*Echidna* and *Ornithorhynchus.*

Sub-Class II. Metatheria, Didelphia or Marsupalia.—Mammals in which the young are born prematurely, in imperfect condition, and are afterwards nurtured in an external abdominal pouch furnished with teats; vestigial allantoic placenta occasionally present; the rectum and urogenital canal open separately, but are surrounded by a common sphincter muscle; scrotum in front of penis; blood temperature varying from 32° to 36° C.; brain less developed than in Eutheria, with or without convolutions:—

Order 1. Polyprotodontia—Opossums, Dasyure, Bandicoot; *Order 2.* Diprotodontia—Selvas, Wombats, Phalangers, Kangaroos.—

Sub-Class III. Eutheria, or Monodelphia.—Mammals in which the young, are vitally connected with the mother by an allantoic placenta before birth and after birth are able to suck; anus and urogenital openings quite distinct; scrotum when present behind penis; blood temperature varying from 35° to 40° C.; brain highly developed and convoluted. Nine orders, which see separately for details:—

Order 1. Edentata—Sloths, Ant-Eaters, etc.; *Order 2.* Sirenia—Dugongs and Manatees; *Order 3.* Cetacea—Whales and Porpoises; *Order 4.* Ungulata—Hoofed Mammals; *Order 5.* Rodentia—Rodents; *Order 6.* Carnivora—Carnivores; *Order 7.* Insectivora—Insectivores; *Order 8.* Chiroptera—Bats; *Order 9.* Primates—Apes, Monkeys, etc.

MAMMARY GLAND, OR BREAST, the organ characteristic of the animals belonging to the order of Mammalia; the gland in the female which secretes milk and by means of which the young are suckled; present in the male only in a rudimentary form. In the human female the m. g's are two in number, situated on the front of the chest, in the adult extending from about the third to the seventh ribs. In the center of the surface is a darker patch of skin, the *areola,* from which arises a conical projection, the *nipple.* The gland itself is composed of about a score of lobes branching to form smaller lobules, bound together with connective tissue and embedded in fat; from each lobe a duct proceeds, to open on the apex of the nipple. The m. g's become considerably enlarged during pregnancy, and very shortly after the birth of the child milk begins to be secreted.

MAMMOTH. See under ELEPHANTS.

MAMMOTH CAVE (37° 11′ N., 86° 3′ W.), large limestone cave, Edmondson co., Ky.; total length of its tunnels is estimated at about 150 miles, of which 10 miles have been explored; contains great number of chambers and rivers. Main cave is about 4 miles long, its largest chamber, known as Chief City, covering area of 2 acres. There are fine stalactites and stalagmites, and many of the passages are covered with crystals of great beauty. Two remarkable species of fish are found in the cave, both blind, and one without even rudimentary eyes.

MAMMOTH TREES. See SEQUOIA.

MAMORÉ (13° S., 65° 25′ W.), river, Bolivia; one of the head streams of the Madeira.

MAMUN, ABDALLAH MAMUN (*c.* 786-833), caliph of Bagdad; founded the coll. of Khorasan, and promoted science, astronomy, and general learning; one of the best Arab. rulers.

MAN. See ANTHROPOLOGY; ETHNOLOGY; MAN, AGE OF.

MAN, AGE OF. The length of time that man has been on this earth is a question that is constantly presenting itself not only to scientists, but also to laymen. The discovery of a skull or even a jaw bone, or a few teeth, awakens in the mind, the thoughts of the early history of man, and we wonder how long ago these primitive ancestors of ours wandered over the earth.

Frequently it is discovered that such finds which appear at first so important are really not worth more than passing notice. But with each one there is always the hope that a great discovery has been made and that the age of man has been carried back further than we had ever supposed possible.

It is important to consider how the age of these finds is determined and to discuss some of the more famous remains that have been brought to light. But before doing this, some of the older and now almost discarded theories of the creation of man should be mentioned.

The biblical theory of the creation carries man back only a few thousand years and shows him to have been created as we know him today—possessed of the highly developed body and mind. The Separate Origin theory holds that the different races sprang into being in the various parts of the world where they are found at the present time. If either of these two ideas is accepted it is not necessary to give to man any great age on the earth. If, however, we believe in the evolutionary theory, namely that man, together with all other living things, grew and developed from simpler forms; that man of today had as his ancestors individuals less developed than he, then one must seek far in the past for the beginnings of the human race.

There are some who claim that we must go back at least two million years in order to reach the point where man broke away from his nearest relatives in the animal world. Others think that five or six hundred thousand years is enough time to have elapsed since man left his animal ancestors and started to develop along his own line. But in either case the time is longer than we can contemplate with any degree of real comprehension.

Most of the important human finds that show man's great age on the earth have been buried in the ground; therefore, if we are able to determine the age of the layers of dirt and stones covering these remains we have approached the length of time that has elapsed since these individuals lived on this earth.

One of the first things that a scientist wants to know when a discovery is made is whether the layers of earth have ever been disturbed. This knowledge enables him to determine whether the skull, or bones, or teeth, as the case may be, have been buried at some fairly late date or whether the age of the layers of earth and the remains are of the same period.

In so limited a space it is impossible to go into a detailed description of the various geological periods. Sufficient to say that we are now living in what is called the Quaternary period and it was here that human life, as such, probably began. During this period there have been four ice ages—that is, times when great sheets of ice covered most of what is now Europe and the northern part of America. The interval between these ages was warm so that the ice melted and retreated to the north and to the mountain tops. As each ice sheet disappeared it left all over the country great layers of dirt and rock which had been washed down. Under these layers there have been found human remains, and there is very good evidence to prove that even before the first ice age began man was an occupant of this earth. The following table will give some idea as to the length of time that must have elapsed since our early ancestors lived in Europe.

		Years
	Postglacial Period	25,000
	(Present Time)	
IV.	Glacial Stage	25,000
	3d Interglacial Stage	100,000
III.	Glacial Stage	25,000
	2d Interglacial Stage	200,000
II.	Glacial Stage	25,000
	1st Interglacial Stage	75,000
I.	Glacial Stage	25,000

This means, then, that man has been on this earth at least five hundred thousand years and there are many who put the age nearer a million.

But it is not only in glacial regions that we find evidences of early man. Deeply buried in the floors of caves that have taken hundreds of thousands of years to form, and far under layers of earth that have been collecting as the result of slow processes of erosion, we find the bones of man.

Scientists are continually searching

over the world for evidences of man's early occupation of the earth. In 1891, Dr. Dubois, a Dutch army surgeon, discovered, on the banks of the Bengawan River in Java, the remains of what may be the oldest known human being; at least they are the oldest that have as yet been brought to light. There were found the top of the skull, a few teeth, and a left thigh bone. From these it has been possible to construct a model of the individual to whom they originally belonged, and also to determine from the shape and the size of the skull a good deal of his mental capabilities and hence his type of civilization. In all probability he lived either before the first glacial period or in the first interglacial stage.

This man has been called Pithecanthropus Erectus, that is an ape-man that walks upright and has been thought by many to be the missing link between man and the ape. He had a lower mentality than any known human being, that is, his skull capacity was only 855 cubic centimeters while the lowest human skull is 930 cubic centimeters. But his was a skull larger than the largest ape which is only 600 cubic centimeters. He was not very tall but his powerful build enabled him to cope with his animal enemies. His forehead was low and receding and his heavy eyebrow ridges overhung his deep-set eyes. He had a massive jaw with a receding chin and his nose was flat with large nostrils. Owing to his curved th'gh bones he walked with a shambling gait. Mentally, he was a child but he had the strength and passions of a man. He might well be called a child of the moment, for he was living only from day to day with no thought of the future. It is probable that his senses were highly developed for it was through his keenness of sight and sense of smell, that he was able to live in an environment where he was surrounded on all sides by powerful enemies of the animal world.

In 1907 there was found deep buried in a sand bank near Heidelberg, Germany, the jaw bone of a human being who was probably only a little above the Pithecanthropus. He lived in Europe at a time when elephants and lions were denizens of that region. This was probably in the second interglacial period, so that many thousands of years elapsed between him and the so-called "missing link."

In 1911 at Piltdown in the southern part of England, there were found various portions of a skull so primitive that we can class it with that of the Heidelberg man. However, there were enough differences to prove that they probably belonged to separate races.

The dissimilarities that we notice in the primitive skulls lead us to the conclusion that even in the early Quaternary period the differentiation between the races had progressed very far, so that in order to find the parting of the ways between the ancestor of man and his nearest ape kin, we shall have to go even further into the past.

A race that lived many years after those already mentioned is known as the Neanderthal race. Many discoveries have been made of the remains of these people. While this group was very much higher in the physical and mental scale than those spoken of above, yet they were still far removed from the last of the pre-historic group known as the Crô-magnon. These latter, lived in Europe about twenty-five thousand years ago and had reached such a development that they were able to exist in their environment with a good deal of comfort. They have left for us a fairly complete story of their civilization in the beautifully wrought stone tools and weapons, and in the clever paintings and sculptures on the walls of their cave homes.

The question is frequently asked why so few remains of man's early ancestors have been found. The dead in those very primitive times may have been thrown to the wild beasts, or they may have been buried in the ground where dampness would disintegrate the bones, or floods may have washed the bodies away. Therefore, the surprising fact is not that we have found so few, but that we have been able to unearth so many.

Up to a comparatively few years ago most people thought that four or five thousand years spanned man's entire life on the earth. Ancient Greece and Egypt seemed to them not far from the Garden of Eden in point of time, and if the tomb of Tut-ankh-amen had been discovered then, the contents would have been looked upon as conclusive proof that the development of civilization was a rapid and not a slow process. But what a different story the last few years have told us. There were discovered a short time ago two bricks buried deep in the mud on the banks of the Nile, one at the depth of twenty and the other twenty-four yards. It is estimated that these bricks are twelve and fourteen thousands years old respectively. There are some scientists who put the arrival of man in Egypt back as far as 72,000 years ago. Thus it is that we now look back upon the discoveries in the tombs of the kings as evidences of a very high civilization that had been slowly evolving through countless ages.

From this sketch it will be evident

that man is not a newcomer on this earth. His first appearance here, as a human being, was hundreds of thousands of years ago, at a time when mammoths and mastodons roamed over the country, and lions, hyenas, bears, and other savage beasts, fought with him for the possession of the caves. As the years go on it is not improbable that new discoveries will be made that will put the origin of man further into the past than we have even dared to dream.

MAN, ISLE OF (*c.* 54° 15′ N., 4° 30′ W.), island in Irish Sea, 16 miles from Wigtownshire, 28 miles from Cumberland, 33 miles from Ireland; has area of 220 sq. miles; surface undulating, sloping up from rocky coast to central ridge, which reaches 2,034 ft. in Snaefell. Chief towns are Douglas, Ramsay, Castletown, and Peel. There are many Runic crosses, stone circles, and other interesting remains.

Island is sometimes conjecturally identified with Rom. Mona, but its early history remains obscure, although it is known to have been inhabited by Celts. Suffered from Scandinavian invasions in IX. cent., towards end of which it was taken by Harold Haarfager. In 1098 it was conquered by Magnus of Norway, and remained under Norwegian control until 1266, when it was transferred to Alexander III. of Scotland. Alexander died in 1285, and the Manx appealed to Edward I., who occupied island in 1290; it was regained by Scots under Bruce in 1313, but ultimately came to possession of English king, *c.* 1346. It was granted at various dates to royal favorites, and in 1406 Henry IV. bestowed it on Sir John Stanley, whose descendants, earls of Derby and kings of Man, held it for many generations almost without interruption. Title of lord was substituted for king in 1651. Island came by inheritance to James, Duke of Atholl, in 1735, from whose successor it was bought by the government in 1765.

Administration is carried out by lieut-gov., a Council, and the House of Keys, latter having 24 members elected by popular vote. Pop. 1921, 50,288. See MAP, BRITISH ISLES.

MANAAR, GULF OF (8° N., 79° E.), arm of Indian Ocean between India and Ceylon.

MANACOR (39° 34′ N., 3° 14′ E.), town, island Majorca, Spain. Pop. 12,600.

MANAGUA (12° 25′ N., 86° 15′ W.), capital, Nicaragua, on Lake M.; exports coffee. Pop. 40,000.

MANAKINS (*Pipridae*), a family of about 100 small brightly colored Perching Birds found living in societies in the dense undergrowth of Central and South Amer. forests.

MANAOAG, town, Luzon, Philippine Islands, on Angalacan. Pop. 17,000.

MANÁOS (35° 15′ S., 60° 55′ W.), city, port, on Rio Negro, Brazil; important center of river trade; chief export, rubber. Pop. 66,000.

MANASSAS (formerly Manassas Junction), town and county seat of Prince William co., Va., and located at the junction of the Southern and Chesapeake and Ohio Railroads. It is 33 miles southwest of Washington, D. C., and derives historic importance from the fact that it was the site of the First and Second Battles of Bull Run, usually referred to by Confederate writers as the battles of Manassia. It is located in a rich agricultural and dairy region. Its chief manufactures are spokes, bricks and paving blocks. It is the seat of Eastern College and the Agricultural High School. There are 8 churches, 2 newspapers, a bank and excellent public schools. Pop. 1,305.

MANASSEH, tribe of Israel named after the elder son of Joseph; occupied a large tract of land on both banks of the Jordan.

MANASSES, PRAYER OF, apocryphal book, probably written in Greek (in which it is preserved), in II. cent. B. C.; in form of a psalm.

MANATEE. See under SIRENIA.

MANBHUM (23° N., 86° 30′ E.), hilly district, Bengal, India; capital, Purulia.

MANBY, GEORGE WILLIAM (1765-1854), inventor of life-saving appliances in cases of shipwreck, *b.* at Hilgay, Norfolk. Entered the army and later attained the rank of captain. In 1783 he caused a line to be thrown from a small mortar over Downham Church, this convinced him, and he found an opportunity for proving its utility in 1808, when a brig was wrecked at Yarmouth and all lives were saved.

MANCHA, LA (38° 47′ N., 3° 40′ W.), former prov. of Spain, now chiefly included in Ciudad Real; the Don Quixote country.

MANCHE (49° N., 1° 20′ W.), maritime department, France, on Mediterranean; part of ancient Normandy; surface hilly; cereals, flax, hemp, fruit cultivated; horses reared; large quantities cider manufactured; capital, Saint-Lô; on N. coast is Cherbourg. Pop. 480,000.

MANCHESTER, city, co. bor., S. E. Lancashire, England (53° 29′ N., 2° 14′ W.). Manchester is said to have been important station of Druids, and was Roman colony with name *Mancunium*; damaged during Dan. invasions in 9th cent.; obtained rights of self-government, 1301; manufacturing importance probably began in 14th cent., when some Flem. weavers are supposed to have settled here; 'Manchester cottons' first mentioned in 1352; had privilege of sanctuary, 1540-41; was taken by Fairfax during Civil War, 1643; old fortifications destroyed in 1652; taken by Charles Edward Stewart in 1745; manufactures greatly increased in 17th and 18th centuries; Bridgewater Canal opened, 1761; became parl. bor., 1832, epis. see, 1847, city, 1853; Fenian outrage occurred in 1867; Manchester Ship Canal opened in 1894.

Manchester is center of great manufacturing dist.; great staple is cotton—spinning, weaving, bleaching, printing—Manchester being central market for cotton trade; there are also works that deal with silk and almost every description of fibre; engineering works. Excellent communication in every direction by canal, road, and rail; has been port since opening of Ship Canal. The collegiate church, now cathedral, and the Chetham Hospital represent mediæval architecture, the warden's room—now the library—in the latter being widely noted. Modern buildings include town hall, built by Waterhouse, and containing fine tempera paintings by Ford Madox Brown; Victoria Univ., formerly Owens Coll., which was incorporated in 1880; Royal Exchange (built 1869); Rylands Library (opened 1897); new Royal Infirmary (opened 1909). The art gallery has a number of pre-Raphaelite paintings; fine public parks; grammar school, 1519, at which De Quincey was educated. Pop. 714,400.

MANCHESTER, town in Hartford co., Conn., on the Hockanum River and the New York, New Haven and Hartford railroad. It was formerly a part of East Hartford, but was incorporated as Manchester in 1823. It has important dairy interests and extensive manufacturing plants, engaged in the production of cotton, silk, wool, paper, needles, soap, tinware and tobacco. There are 2 public libraries, excellent schools and churches, national and savings banks and daily and weekly newspapers. The town was re-incorporated in 1907 and is patterned after the commission form of government, authority being vested in a body of seven supervisors. Pop. 1920, 18,370.

MANCHESTER, largest city of that state and a county seat of Hillsboro co., N. H., located on the Merrimac River and the Boston and Maine railroad. Its first settlement dates back to 1722. It became a city in 1846. Its fine water power has made it one of the important cities of the world in the manufacture of cotton and woolen goods. One of its mills alone employs 16,000 operatives, and the average annual output of the cotton mills exceeds 250,000,000 yards. It is also the fifth shoe manufacturing city in the country. There are 60 other industries, of which the most important are paper mills, tanneries, iron works, hosiery mills, lumber mills and furniture factories. The city is handsomely laid out, and its park system embraces more than 200 acres. There are many notable structures, including the Carpenter Library, Federal Building, State Reform School, Masonic and Children's Homes and the County Court House. Its churches represent all the leading denominations, and its educational facilities are among the best in the State. The city has been the seat of a Roman Catholic bishop since 1884. The water supply system is owned and operated by the city. There are 9 daily and weekly newspapers and 18 banking institutions. Pop. 1920, 78,384.

MANCHESTER SHIP CANAL. See CANAL.

MANCHURIA, large dist. of N. E. China (*c.* 39° 5′-53° 20′ N., 115° 50′-135° E.), which gave China the Ching dynasty; it is irregular in outline, and has an area of 363,610 sq. m.; it belongs almost entirely to basin of Sungaria, and drains northward to Amur R., which forms N. and N. E. frontier; surface generally mountainous; climate extreme; contains three provinces, Hei-lung-chiang, Kirin, Feng-tien; cap. Mukden; chief industries, agriculture, cattle rearing; rich in minerals, including gold, iron, coal; valuable forests of pine, oak, elm, walnut; silks, furs, skins exported; indigo, opium, cotton, tobacco grown; traversed by branch of Trans-Continental Railway; came much under Russian influence towards end of 19th cent.; Russian occupation in 1900 led to Russo-Japanese War, 1904, at close of which treaty was arranged, 1905, whereby both countries evacuated the dist., which was then restored to China. Pop. *c.* 15,000,000. See MAP, ASIA.

MANCHUS. See CHINA.

MANCINI, PASQUALE STANISLAO (1817-88), Ital. Liberal statesman, lawyer, and orator; Minister of Justice and Ecclesiastical Affairs, 1860; of Public

Instruction, 1862; of Foreign Affairs, 1881-85.

MANDALAY (21° 59′ N., 96° 8′ E.), town, Upper Burma, on Irrawadi; founded, 1856; was capital of former kingdom of Burma; contains the royal palace; silk-weaving. Pop. 185,000.

MANDAMUS. The principal application of the prerogative writ of *mandamus* from the High Court is in calling upon justices of the peace to show cause why they should not exercise their jurisdiction in a particular case, and, generally speaking, the object of the writ is to enforce the performance of some duty or to test the legality of the performance by the inferior court of some duty *of a public nature in respect of which there exists no other available and adequate legal remedy.*

MANDARIN, Chin. civil official, so named by foreigners; nine grades, each with different insignia; they govern Chin. provinces; carefully controlled by central board.

MANDARIN DUCK, or **CHINESE TEAL** (*Aix galericulata*), a very small ornamental waterfowl. The drake's head has a long, erectile crest, green, purple, and chestnut in color, and a curious fan or sail. A duck and drake are an extraordinarily devoted pair.

MANDATE. By the Treaty of Versailles, June 29, 1919, provision was made for the administration of the colonies and territories taken from the late enemies of the Allies, whereby, instead of being transferred absolutely to new owners, they are held by powers that are mandatories of the League of Nations, and should form 'a sacred trust of civilization.' The mandatories are required annually to report to Permanent Mandates Commission regarding the territories committed to their charge. The character of the mandate differs according to the stage of development of the people concerned, the geographical situation of the country, its economic conditions, and other similar circumstances. Chief mandates are:

Great Britain.—(1) The greater portion of Tanganyika territory. (2) Small portions of Togoland and Kamerun. (3) Mesopotamia. (4) Palestine.

The British Empire.—Nauru Islands.

Australia.—Ex-German New Guinea and ex-German islands S. of the equator, except Samoa.

New Zealand.—Samoa.

South Africa.—S. W. Africa.

France.—(1) The greater portion of Kamerun and (2) Togoland. (3) Syria.

Belgium.—Two districts in Tanganyika territory.

Japan.—The islands north of equator in Pacific Ocean.

MANDAUE, town, Cebu, Philippine Islands. Pop. 11,000.

MANDEVILLE, BERNARD DE (1670-1733), Dutch physician, who, coming to England, wrote *Fable of the Bees,* 1723, and other works. He thought most 'virtues' hypocrisy, and that society was only advanced by selfish interest.

MANDEVILLE, JEHAN DE, SIR JOHN M., pseudonym of writer of amazing book of travel, now generally attributed to Jehan de Bourgogne, or Jehan à la Barbe, a XIV.-cent. Liège physician, who, if not the author, certainly assisted largely in compiling the book. It has been suggested that de Bourgogne wrote the book in conjunction with a certain John Mangevilayn, who with a Johan de Burgoyne are mentioned as having taken part in the revolt against the Despensers, 1321.

The book is a truly astounding collection of travelers' tales, culled from various sources and eclipsing even Herodotus in fantastic extravagance. 'Mandeville' journeyed to Constantinopie, through Asia Minor to India, and finally across the continent to China, where he took service with the emperor and only returned, 1357, because of ill-health; he served under the Sultan of Egypt and made the acquaintance of Prester John. Between fragments of historic narrative come fabulous accounts regarding monsters, cannibals, and men of wondrous shapes.

MANDINGO, Negro race, W. Africa; many and various tribes speak Mandingo; reside chiefly in S. W. Sahara, on Upper and Lower Niger, in Upper Senegal, S. W. Liberia, interior of Sierra Leone and Ivory Coast; original settlement in Western Nigeria, about A. D. 1000; largely a commercial people in Middle Ages.

MANDOLINE, a stringed musical instrument of the lute family (treble member), but with deeper convexity of back. It is of Italian origin, but is now common in most civilized lands. The two chief varieties are the Neapolitan (with four pairs of metallic strings), and the Milanese (with five pairs). It is played with a plectrum or quill of tortoise-shell, whale-bone, or some pliable substance, held in the right hand. The fingerboard, or neck, has many frets across.

MANDRAKE, or *Mandragora,* a small genus of perennial plants of the order Solanaceæ, of exceptional legendary interest. They are stemless plants,

with thick tap roots and dark-green wrinkled leaves. *M. autumnalis* bears pale purple flowers in September, and *M. officinar* white or blue flowers in May, followed by yellow, globose fruit. Both have been supposed to be the M. of Genesis, and the plants were and still are credited with many miraculous properties.

MANDRILL, a large W. African baboon with immense canine teeth and other features in which it approaches the carnivora. Its large blood-red ischial callosities, and huge, naked, gaudily-striped cheeks, render it one of the most hideous creatures in nature. It is insectivorous.

MANDSAUR, MANSASOR (24° 3′ 75° 8′ E.), town, Gwalior, India; trade in opium. Pop. 21,000.

MANDU, MANDOGARH (22° 21′ N., 75° 56′ E.), ruined city, Dhar state, Central India; capital of ancient kingdom of Malwa.

MANDURIA (40° 25′ N., 17° 37′ E.), town, Apulia, Italy; Roman *Manduriuм.* Pop. 13,000.

MANDVI (22° 50′ N., 69° 31′ E.), seaport, Cutch, India, on Gulf of Cutch. Pop. 25,500.

MANET, EDOUARD (1832-83), Fr. realistic painter whose study of light paved the way for the later impressionists. The novel treatment of his *Olympia* (in the Luxembourg, Paris), which reveals his endeavor to give purity of outline, awoke bitter hostility; he deeply influenced the development of Fr. art.

MANETHO, Egyptian historian; fragments of work survive in Josephus, etc.

MANFRED (*c.* 1232-66), king of Sicily; natural *s.* of Emperor Frederick II.; as guardian of nephew, Conradin, drove papal forces from Sicily, and himself assumed Conradin's crown, 1258; successfully opposed pope in Italy, but finally slain.

MANFREDONIA (41° 35′ N., 15° 55′ E.), seaport town, Foggia, Italy, on Gulf of Manfredonia; founded by Manfred; near site of ancient *Sipontum.* Pop. 12,000.

MANGALORE (12° 52′ N., 74° 52′ E.), seaport, capital of S. Kanara district, Madras, India; besieged and taken by Tippoo Sahib, 1784; exports coffee, timber. Pop. 45,500.

MANGAN, JAMES CLARENCE (1803-49), Irish poet.

MANGANESE. Mn. Atomic Weight 54·93. A hard, brittle metal, having the color and appearance of cast iron, with a specific gravity of 8·0. It is readily attacked by the oxygen of the air, so that it must be kept under oil in sealed containers. It melts at about 1245°C. It decomposes water with the evolution of hydrogen, and dissolves readily in all dilute acids. It occurs abundantly, the ores of commerce being obtained chiefly from India, Brazil and Russia, although many minerals containing manganese are found throughout the United States and Canada. The most important one is the dioxide, MnO_2, known as pyrolusite. Others are braunite, Mn_2O_3, hausmannite, Mn_3O_4, manganite, Mn_2O_3, H_2O, and psilomelane, a compound oxide of barum and manganese. There are also various sulphides, carbonates and silicates, the best known being rhodonite, a silicate found in the Ural Mountains, used as an ornamental stone because of its red color. The metal is obtained from its ores either by reduction with aluminum or by means of the electric furnace. The metal is largely used in metallurgy for the preparation of various alloys, such as manganese bronze, alloys with aluminum, antimony, tin, and bismuth, and the well-known manganese steels. Iron alloys with manganese in all proportions, the presence of manganese increasing the tenacity of steel and improving its working properties. Manganese steel, containing about 10 per cent. manganese, is very hard and tough, and is used for jaws of rock breakers, and other machinery.

MANGE, a parasitic disease of the skin caused by the presence of minute mange-mites. They are of four main kinds: (1) Sarcoptes, which burrow through the skin; (2) Psoroptes; (3) Symbiotes; and (4) Dermatodectes, which are more superficial in their operations. M. affects the horse, cow, sheep, pig, dog, cat, and also man. M. in horses is compulsorily notifiable to the local authorities, as also is psoroptic M. in sheep or sheep scab. Repeated application of greasy dressings destroys the parasites.

MANGEL-WURZEL, more correctly, the 'mangold-wurzel,' is a cultivated variety of beet much grown as cattle food. The large tap-root stores its carbohydrate food reserves as sugar.

MANGIN, CHARLES MARIE EMMANUEL (1866), Fr. soldier, *b.* Sarrebourg, Moselle; was on staff of Marchand's Fashoda mission, 1897; played a prominent part in conquest of Morocco, 1911-13; appointed brigadier-general in 1913. During World War he commanded a division at battle of the

Marne, and when his troops were overtaken by furious counter-attack, restored confidence by his personal example and saved situation. The labyrinths of Neuville-St. Vaast were the prelude to his arrival at Verdun, March, 1916, where he recaptured Douaumont and Vaux. In offensive of April, 1917, which failed in its objective, his tactics were criticized and his actions inquired into; but he was exonerated, and was immediately back in forefront of battle. He crowned his victories by his brilliant defeat of the enemy N. of Chateau-Thierry, July, 1918, and by a series of stubborn assaults which forced the German retreat. After the Armistice he commanded the Allied armies of occupation with headquarters at Mayence; organizer of the Fr. 'black army.'

MANGO, tree of order Anacardiaceæ; grows in E. Indies, Australia, etc.; fruit, oval in shape, is edible.

MANGROVE (*Rhizophora*), tropical tree whose branches droop to earth.

MANHATTAN, BOROUGH OF, richest and most important of the five boroughs that compose New York City, N. Y. It comprises Manhattan Island, on which the city of New York was originally founded, together with Blackwell's, Randall's and Ward's Islands in the East River; Governor's, Bedloe's and Ellis Islands in the Upper Bay and Marble Hill north of the Ship Canal. The area of the Borough is 21.9 square miles. The length is about 13 miles and the width varies from ½ mile to 2¼ miles. No other district within equivalent boundaries has so large a population, controls so much wealth, sells so many products or handles such an amount of foreign commerce. Pop. 2,284,103. See NEW YORK CITY.

MANHATTAN, a city of Kansas, and county seat of Riley co., located at the junction of the Big Blue River about 50 miles west of Topeka, and served by the Union Pacific and the Chicago, Rock Island and Pacific railroads. It is in the center of a rich agricultural region, and the presence of large limestone quarries in the vicinity contribute to its prosperity. Its main industrial establishments are machine shops, brickyards, flour and lumber mills. It does a considerable export trade in grain, livestock and limestone. It has good public schools, churches, 5 banks and 9 newspapers and periodicals. The waterworks are municipally owned, and the city is operated under the commission form of government. Pop. 1920, 7,989.

MANHATTAN COLLEGE, a Roman Catholic institution, founded in New York City, in 1849, by the Christian Brothers, and at first known as the Academy of the Holy Name. It has no endowment and is supported from tuition fees alone. Until 1853 it was an academy for young men, acquiring a college status after that. The buildings and grounds are valued at $625,000. In the fall of 1921 it had a student body of 480 and a faculty of 40.

MANHATTAN ISLAND, the site of the chief portion of New York City, is a rocky tongue of land, 13½ miles long, running north and south, and 2¼ miles in width near its middle, at Fourteenth St. It is bounded on the north by Spuyten Duyvil Creek and the Harlem River, on the west by the Hudson, also known as the North River, on the east by East River, properly a reach of Long Island Sound, the southern end reaching into New York Bay. Its highest portion is Washington Heights, near the northern end, with an altitude of 238 feet. According to historical records the Dutch purchased the Island from the Indians for $25.

MANICHÆISM, a religion founded by Mani, and of considerable importance as a rival to Christianity. Almost from the start Christianity had been threatened by confused Oriental speculations; it came into conflict with Gnosticism—some forms of Gnosticism, indeed, took on a semi-Christian dress—then with Mithraism, perhaps the most serious rival it has ever had, then with Manichæism. Mani was a Syrian born about 215-16, crucified 276 A. D. His object was to renovate the old Zoroastrian faith, though he mixed it up with various other elements, viewing himself as the successor of Zoroaster, Buddha, and Jesus.

MANICURE, the professional care and treatment of the hands, especially the nails. One who is professionally engaged in this is called a manicurist.

MANIFEST (from Lat. *manifestus*, plain), a document, signed by the master of a vessel, and containing a list of all the packages or separate items of freight on board the vessel, with their distinguishing marks, numbers, destination, description, etc. It is designed for the use and information of the Custom House officers.

MANIHIKI (10° S., 115° W.), archipelago, Central Pacific, between Marquesas and Union Islands; dependency of New Zealand.

MANILA, seapt. and cap., Philippines (14° 35′ N., 120° 58′ E.), on S. W. coast of Luzon; founded by Spaniards in 1571, remaining in their

possession until taken by Admiral Dewey after destruction of Span. fleet in Manila Bay during Spanish-American War, 1898; has cathedral and archbishop's palace, many monasteries and churches; site of St. Thomas Univ., founded 1857; numerous colleges, schools, and charitable institutions; contains governor's palace, justice of the peace courts, arsenal, observatory. Situated on a fine harbor, Manila is an important commercial center; exports Manila hemp (much used for cordage), cigars, sugar, copra, coffee, indigo, dyewoods, mother-of-pearl, tortoise shell; imports manufactured goods, provisions. Pop. 266,-900.

MANILA, UNIVERSITY OF, an educational institution founded by the Spanish monasterial corporations in 1535, under the patronage of Philip II., of Spain. It was at first open only to the children of the aristocratic office holders and army officers in the Islands, but in 1911 it was thrown open to the sons of natives as well. After the American occupation, in 1899, its administration was reorganized on a more liberal basis. It has departments of the sciences, classics, law, medicine, theology, philosophy, engineering, pharmacy, the arts and music. The average number of students is 800.

MANILA HEMP, the fibrous product of the leaf stalks of *Mus atextilis,* a plantain-like form which is a native of the Philippine Islands; used for similar purposes to ordinary hemp.

MANIN, DANIELE (1804-57), Venetian patriot; roused Venice against Austria, and was imprisoned, 1848; released by Venetians and made pres. of republic; after failure of joint Ital. rising, Venice still held out; M. forced to capitulate, after heroic defense, 1849; *d.* in exile.

MANIPLE, a narrow band of material, sometimes embroidered, worn on the left arm by subdeacons and higher orders in Catholic Church, mostly at Mass; probably developed from handkerchief carried by ancient Rom. magistrates.

MANIPUR.—(1) (*c.* 24° 42′ N., 94° E.) native state, N. E. India, bordering on Assam and Burma; area, 8,400 sq. miles; surface generally mountainous, extensive valley in center; forested; produces rice, tea, cotton; scene of Brit. punitive expedition, 1891, to avenge murder of Brit. officials. Pop. *c,* 225,000. (2) (24° 48′ N., 94° E.) capital of above. Pop. *c.* 70,000.

MANISSA, MANISA (38° 36′ N., 27° 27′ E.), town, Asia Minor, on Gediz-chai, at foot of Mount Sipylus; ancient *Magnesia ad Sipylum*; contains palace of

MANISTIQUE, a city of Michigan. Pop. 1920, 6389.

MANISTEE, a city of Michigan, and county seat of Manistee co., located on Lake Michigan at the mouth of the Manistee river and served by the Pere Marquette and Manistee and Northeastern railroads. The first settlers located there in 1840 and in 1869 the town received a city charter. It has a good harbor, which has an advantage over most other lake ports in that it is open for navigation all through the winter. Lumber and salt are the principal industries, nearly three million barrels of the latter being shipped yearly. Excellent steamer lines connect the city with Chicago, Milwaukee and other lake ports. There are electric lights, waterworks, handsome churches, commodious public schools, 3 national and savings banks and 2 newspapers. The commission form of government was inaugurated in 1914. Pop. 1920, 9,694.

MANITOBA, prov., Canada (53° N., 98° W.), bounded N. by Keewatin, E. by Hudson Bay, Keewatin, Ontario, S. by U. S. A., W. by Saskatchewan; surface is generally undulating; many large lakes, including Winnipeg, Winnipegosis, Manitoba, Island, South Indian, Granville, and Etawney; drained by the Nelson, Hayes, Winnipeg, Red R., and other streams; chief towns, Winnipeg (cap.), Brandon; Port Nelson and Port Churchill on Hudson Bay. The province is administered by a lieut.-gov., assisted by executive council and legislative assembly; represented in Dominion Parliament by 4 senators and 10 members of House of Commons; education is free; there is a provincial univ. Manitoba is a great wheat-province—'Manitoba No. 1 Hard' is the world's standard wheat; other cereals produced; livestock raised, dairy farming carried on; coal in south; believed to have rich gold deposits; valuable fisheries. Manitoba was first settled by French, 1734; afterwards came under control of Hudson Bay Co.; became prov. of Dominion of Canada, 1870; Riel rebellion, 1869-70; large part of Keewatin joined to Manitoba, 1912. Area, 251,832 sq. m. (19,906 sq. m. water); Pop. 553,800. See MAP OF CANADA.

MANITOBA (51° N., 98° 40′ W.), lake, Manitoba, S. W. of Lake Winnipeg; outlet, Little Saskatchewan.

MANITOU, the name given by several American Indian tribes to the presiding spirits which figure in their religious beliefs. Their number is unlimited, as

individuals are each supposed to have a M. or protecting spirit. The M. is in almost all cases some animal chosen by the individual to be the object of his worship.

MANITOULIN ISLANDS—comprising Grand Manitoulin or Sacred Isle, Little Manitoulin or Cockburn Isle belonging to Canada, and Drummond Isle belonging to the state of Michigan—are situated in Lake Huron. Grand Manitoulin is 90 m. long by 5 to 30 m. broad. Pop. 2,000.

MANITOWOC, a city of Wisconsin, and county seat of county of the same name, on Lake Michigan and on the Wisconsin Central and Chicago and Northwestern railroads. The city has an excellent harbor and carries on an extensive commerce with all the important lake cities. Its industries are many and varied, including shipbuilding and repair yards, grain elevators, brickyards, creameries, planing mills, agricultural implements, furniture, flour, cigars, machinery and glue. The city has gas works, electric light plants, a good educational system, 4 newspapers and 4 banks. Its charter as a city was granted in 1870. Pop. 1920, 17,563.

MANIZALES (5° N., 76° W.), city, Colombia; exports gold. Pop. 35,000.

MANKATO, a city of Minnesota, county seat of Blue Earth co., located at the junction of the Minnesota and Blue Earth rivers, about 85 miles southwest of St. Paul. It is served by the Chicago, Milwaukee and St. Paul, Chicago Great Western, Chicago and Northwestern and the Chicago, St. Paul, Minneapolis and Omaha Railroads. It is situated in the center of a rich agricultural region, of which it is the natural market and shipping point. Its industries are many and diversified, and are fostered by the excellent hydro-electric power secured by the harnessing of the Rapidan Dam, nine miles south. The chief manufactured products are knit goods, quarry products, tile and building blocks, shirts, cigars, brooms and machine shop products. There are 20 churches, fine public schools, a State Normal school, Lutheran and Catholic colleges, a commercial school and a Carnegie public library. There are 11 banking institutions and 4 newspapers. Mankato was chartered as a city in 1868 and is under the commission form of government. Pop. 1920, 12,469.

MANLIUS, name of Rom. patrician *gens*; plebian Manlii who appear are due, it is thought, to confusion with names Manilius and Mallius. Chief members, Marcus Manlius Capitolinus, who saved Capitol from Gauls, 390 B. C.; Titus Manlius Imperiosus Torquatus, dictator, 353, 349; consul, 347, 344, 340; won famous victories over Gauls and Latins.

MANN, HORACE (1796-1859), an American educator; *b.* in Franklin, Mass. He graduated from Brown University, in 1819, studied law and began to practice in Dedham, Conn., until 1833. He then removed to Boston where he entered politics, being elected to the legislature, and later to the state senate, of which he became president. For eleven years he was secretary to the State Board of Education, and thus first became interested in the problems of public education. In this office he assumed the task of entirely revising the state system of public schools. From now on he devoted himself entirely to this subject, his reports being read in England as well as in this country. In 1848 he was elected to Congress as the successor of John Quincy Adams. In 1852 he was invited to accept the presidency of Antioch College, in Yellow Springs, Ohio, which he did after refusing the nomination for the governorship of Massachusetts. Here he remained until his death.

MANN, JAMES ROBERT (1856-1923) U. S. Congressman; *b.* near Bloomington, Ill. He graduated from the University of Illinois, in 1876, studied law and began to practice in Chicago. He was a member of the Chicago board of aldermen during 1893-96; master in chancery of the superior court of Cook co. during 1892-96, and was then elected to Congress as a Republican, being re-elected continuously for terms extending to 1925. He was the minority leader of the 62nd and 65th Congresses.

MANNA, the exudations of various plants growing in the Mediterranean region. Among these may be mentioned the manna ash (*Fraxinus ornus*) and *Tamarix mannifera.* This last is probably the m. of the Bible, and consists of a white substance produced by the attacks of an insect.

MANNHEIM, tn., Baden, Germany (49° 31′ N., 8° 28′ E.), at confluence of Rhine and Neckar; chief building, palace containing picture-gallery, antiquarian collections, and public library; at head of regular Rhine navigation and principal commercial center of Baden; manufactures machinery, electrical plant, motor cars, glass, chemicals, carpets; destroyed in Thirty Years' War, and again by French, 1689; during the World War was bombed by Fr. and Brit. aircraft on several occasions. Pop. 206,000.